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Munnar Hills
Kite flying hazards
Ashy Woodswallow

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- To promote awareness of birdwatching amongst the general public.
- To establish and maintain links/liaison with other associations or organized bodies in India or abroad whose objectives are in keeping with the objectives of the Trust (i.e. to support amateur birdwatchers with cash / kind for projects in ornithology).

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Bird diversity of protected areas in the Munnar Hills, Kerala, India

Praveen J. & Nameer P. O.

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Introduction

The Western Ghats, one of the biodiversity hotspots of the world, is a 1,600 km long chain of mountain ranges running parallel to the western coast of the Indian peninsula. The region is rich in endemic fauna, including birds, and has been of great biogeographical interest. Birds have been monitored regularly in the Western Ghats of Kerala since 1991, with more than 60 surveys having been carried out in the entire region (Praveen & Nameer 2009). This paper is a result of such a survey conducted in December 2012 supplemented by relevant prior work in this area.

Munnar Hills (10.083°–10.333°N, 77.000°–77.617°E), forming part of the High Ranges of Western Ghats, also known as the Kannan Devan Hills, have four protected areas (PAs) (Table 1, Fig. 1), three of which were notified after 2000; all within the jurisdiction of Munnar Wildlife Division. These hills, rising to altitudes ranging from 1600 m to 2685 m, form a part of the Anamalais sub-cluster in southern Western Ghats (Nair 1991; Das *et al.* 2006). Anamudi (2685 m), the highest peak in peninsular India, lies in these hills inside Eravikulam National Park (NP). Two other protected areas, namely Chinnar Wildlife Sanctuary, and Mathikettan Shola National Park, are also part of Munnar Wildlife Division, but are not technically part of the Munnar Hills, and are hence not covered in this paper.

Table 1. Protected Areas (PA) of Munnar Hills

Protected Area	Abbreviation	Area (in sq.km.)	Year of formation
Anamudi Shola NP	ASNP	7.5	2003
Eravikulam NP	ENP	97	1975
Kurinjimala WLS	KWLS	32	2006
Pampadum Shola NP	PSNP	11.753	2003

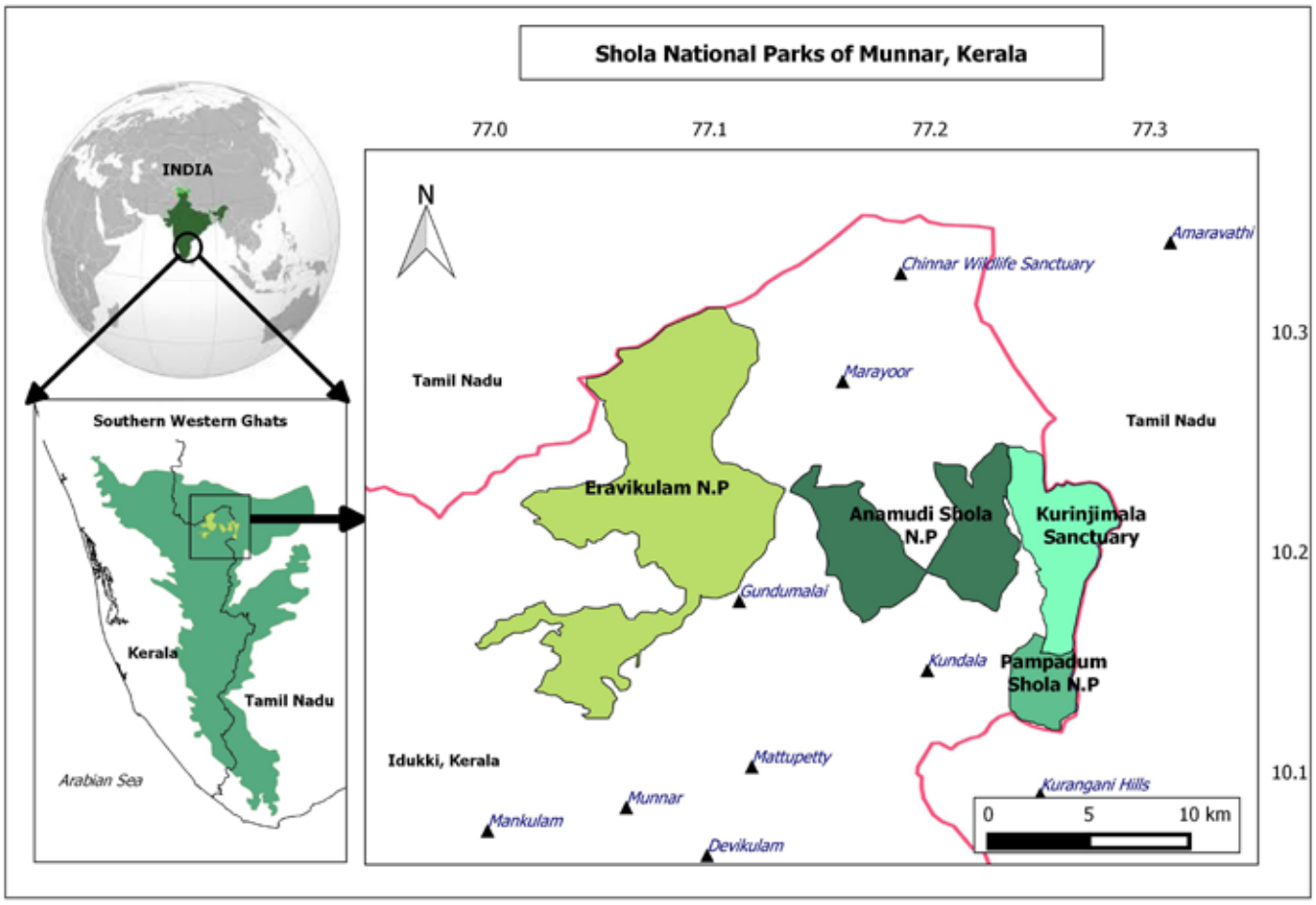

Fig 1: Protected areas under Munnar Forest Division

Munnar Hills enjoy a tropical montane climate. The average annual rainfall is *c.* 5000–6500 mm. The area receives both, the south-west, as well as the north-east monsoons. The mean monthly minimum temperature is 11.9ºC, while the mean monthly maximum temperature is 22.5ºC (Anonymous 2010).

Three major types of plant communities are found within these protected areas, namely grasslands, shrub lands, and forests. Primarily grasslands cover the terrain above 1800 m. Valleys are extensively forested. Shrub lands predominate along the bases of the cliffs and are interspersed in rocky slab areas. Grasslands cover 48% of the area, shola forests about 27%, while the rest of the habitat is under shrub lands, sub-tropical hill forests, wattle, and eucalyptus plantations (Menon 1997). The following vegetation types have been documented from this area (classification from Champion & Seth (1968) are provided within parentheses).

- Shola forests (Southern montane wet temperate forest).
- Grasslands (Southern montane wet temperate grass land).
- Transition forests (Southern sub-tropical broad leaved hill forest).
- Evergreen forests (Southern west-coast evergreen forest).
- Shrub lands.
- Deciduous forests (Southern tropical moist deciduous forests).

Though the most prominent mammal species in these hills is the Nilgiri tahr *Nilgiritragus hylocrius*, about 49 species of mammals, 33 reptiles, 22 amphibians, and 101 butterflies have been reported from Eravikulam NP (Anonymous 2010) alone. Similar inventories for the other three newer protected areas do not exist.

Compared to several other regions in the Kerala Western Ghats, certain parts of the Munnar Hills have been reasonably well worked in terms of ornithology. However, detailed studies inside the protected areas are still patchy and comprehensive studies nil. Salim Ali's was the first formal study in 1933, of the avifauna of Munnar, during his legendary Travancore-Cochin Ornithological Survey. He spent four days around Munnar and recorded just 33 species (Ali & Whistler 1933). It is unclear whether his studies included the present day protected areas. Primrose (1938) followed up with some observations from Munnar that more or less matched Ali's work in terms of species and abundance. The same areas were covered after 75 years in 2009 by a team led by C. Sashikumar, as a part of the repeat survey along Ali's trail (Sashikumar *et al.* 2011b). During this survey, one transect each was inside Anamudi Shola NP, and Pampadum Shola NP. Apart from creating a checklist, they also estimated the density of birds; however, the results were not presented separately for the PAs. The repeat survey also covered several degraded habitats, including tea plantations and water bodies, and it recorded 111 species of which some were water birds. The lone bird survey in Eravikulam NP was conducted from five base-camps—Poovar, Eravikulam Hut, Lakkamkudi, Rajamala, and Anamudi—in 1997 and recorded 91 species (Uthaman 1999). The avifauna of Mannavan Shola [present day Anamudi Shola NP] was surveyed by P. Radhakrishnan as part of his M.Sc. dissertation, and by Nameer P. O., as a part of his doctoral studies (Nameer 2005). Their methodology was similar to the present survey, and 41 species were recorded. Zacharias & Gaston (1999) had included Munnar also as a field site for their studies on birds with disjunct distribution, though it is unclear whether their study site was inside one of the current PAs. Since 1980 Munnar has been on the itinerary of several international bird tours that focused on endemics that resulted in publications by Harrap & Redman (1990), and Robertson (1991). Bird tour groups have frequently visited many parts of the Munnar Hills, particularly the Rajamala region of Eravikulam NP since 2000. Some of these, mainly led by K. V. Eldhose, have shown up several interesting sightings; those that were confirmed till 2010 were summarised in Sashikumar *et al.* (2011a). That publication also carried separate checklists for Eravikulam NP, and the Munnar Hills, including Anamudi Shola NP, and Pampadum Shola NP, apart from areas in current Munnar Forest Division (Sashikumar *et al.* 2011a: 115, 742). However, it should be noted that almost all interior regions of Eravikulam NP are inaccessible to a bird tourist and can only be covered through specific surveys like the present study.

The broad objective of our study was to collect baseline ornithological data in the four protected areas of Munnar Wildlife Division. The specific objectives were to try and ascertain the status of the indicator species in the Munnar Hills, such as

- Threatened/Near-threatened species
- Western Ghat endemics
- Birds of prey
- Ground birds
- Primary hole nesting birds
- Brood parasites

Methodology

Nine base camps were selected for the study of the birds of Munnar Hills (Table 2), in such a way that all PAs, representative habitats, and altitudes were covered. It is noteworthy that all

Table 2. Basecamp details of the Munnar Hills bird survey.

Camps	PA	Coordinates	Altitude Range in m (Camp altitude)	Habitats
Rajamala	ENP	10.015°N 77.033°E	1900–2685 (2100)	Shola, Grasslands, rocky out-crops and shrubs, adjacent to tea plantations
Eravikulam Hut	ENP	10.217°N 77.083°E	2000–2300 (2180)	Shola, Grasslands
Kolukkan	ENP	10.233°N 77.033°E	2000-2300 (2134)	Shola, Grasslands
Varattukulam	ENP	10.217°N 77.001°E	1900-2340 (2245)	Shola, Grasslands, adjacent to degraded grasslands
Poovar	ENP	10.283°N 77.083°E	1900-2300 (2135)	Shola, Grasslands
Methappu	ASNP	10.183°N 77.002°E	1800-2200 (2070)	Sholas [unique as this has tall trees also], shrubs, some abandoned wattle plantations.
Top Station	PSNP	10.133°N 77.025°E	1900-2200 (1910)	Sholas, wattle plantations, a small check-dam (waterbody)
Kadavari	KWLS	10.217°N 77.283°E	1600-2400 (2154)	Wattle plantations, degraded grasslands, shrubs, sholas
Neduvarpp	KWLS	10.002°N 77.267°E	1700-2300 (2130)	Wattle plantations, degraded grasslands, shrubs, sholas

basecamps covered by Uthaman (1999) were included by us with one change—Varattukulam camp, which is inside the PA, was included in place of Lakkamkudi camp that was technically outside the PA and covered only slopes of the Eravikulam Plateau.

The intensive survey of four days was conducted from 07 to 10 December 2012 by *c.* 50 birdwatchers from various parts of southern India. Each survey team comprised at least one seasoned bird-watcher, who could identify all the forest and grassland birds with confidence. Prefixed transects radiating from the base camps were followed during 0700–1000 hrs, and 1530–1800 hrs. Each team of two–three members chose a three–four hour transect route in a base camp for a day. The same transect was worked upon during the morning as well as the evening. An average walking pace, of about two–three kilometers per hour, amenable to bird watching, was followed. The observations recorded included basic information, such as transect name, name of birdwatchers, start time, end time, date, and weather conditions. When a bird was sighted, notes on time of sighting, bird species, and number of individuals, habitat, and remarks were noted. After the three hour transect, the team was free to walk further to explore. While in this exploratory walk, the team recorded only those species which were not recorded during that particular transect. The birds were identified from sightings with the help of binoculars, and vocalisations; the following field guides (Grimmett *et al.* 2011; Kazmierczak 2000; Rasmussen & Anderton 2012) were used for confirming sightings. The data thus collected were recorded in the prescribed data sheet. On the last day of the survey there was a plenary in which the findings of each team was rigorously reviewed.

The data were analysed using the software BIODIVERSITY PRO Version2 (McAleece 1997). The bird species were then assigned to various feeding guilds such as 'aerial' (AER), 'aquatic' (AQ), 'bark surface feeders' (BAR), 'canopy insectivores' (CAN), 'carnivores' (CAR), 'frugivores' (FRU), 'nectarivore-insectivore' (NEC), 'omnivore' (OMN), 'piscivores' (PIS), 'terrestrial insectivores' (TER), 'understorey insectivores' (UND), modified after Raman *et al.* (1998), and Praveen & Nameer (2009).

At present, since there is no standard updated bird checklist for Kerala, or for that matter, India, that is in sync with the latest taxonomic inputs, we follow the IOC's World Checklist version 4.3 (Gill & Donsker 2014) for taxonomic sequence and English / scientific names. While compiling the checklist obtained from this survey, we also compared it with Uthaman (1999), Sashikumar *et al.* (2011a), and Nameer (2005). We ensured that species that were recorded outside the PAs were excluded on a case-by-case basis; at times reviewing them with K. V. Eldhose who is familiar with the area. Additionally, none of the unconfirmed species from those lists figure here.

Table 3. Survey effort details and total number of birds seen.

Camps	# Transects	# Transect hours	# Birds	# Species
Eravikulam Hut	8	19.13	472	38
Kadavari	8	14.32	402	38
Kolukkan	11	34.72	490	41
Methappu	8	20.30	446	41
Neduvarpp	8	19.32	373	36
Poovar	5	07.50	400	25
Rajamala	5	13.75	291	57
Top Station	8	24.13	1365	68
Varattukulam	3	13.72	197	32
Total	64	166.88	4436	113

Overview of results

Survey teams worked on 72 transects (Table 3), counting 5816 birds of 120 species (Appendix). 79 species were recorded from the camps of Eravikulam NP, 55 from those in Kurinjimala WLS, 68 from Pampadum Shola NP, and 41 from Anamudi Shola NP. Combined with past studies (Ali & Whistler 1935, Uthaman 1999, Nameer 2005, Sashikumar *et al.* 2011a, 2011b), this takes the checklist to 143 species. All transect lists were uploaded into a web-based forum (www.ebird.org) for public access. The following were significant sightings of the survey.

Pallid Harrier *Circus macrourus*

All sightings were from the camps in Eravikulam NP, namely, Eravikulam Hut, Poovar, and Kolukkan, indicating its preference for vast and undisturbed grasslands. Considered an uncommon winter visitor to Kerala (Sashikumar *et al.* 2011a). The grasslands of Eravikulam NP are probably the best remaining habitat in the state for this 'Near-threatened' species.

Common (Steppe) Buzzard *Buteo [buteo] vulpinus*

A total of 14 independent sightings from Eravikulam Hut and rest of the sightings dispersed over various camps like Kolukkan, Poovar, Rajamala, Neduvarpp – clearly a bird of the grasslands. Generally rare everywhere in southern India except in ideal grassland habitats of the Western Ghats, like the Nilgiris (Zarri *et al.* 2005), and Munnar hills.

Mountain (Legge's) Hawk-Eagle *Spizaetus [nipalensis] kelaarti*

Recorded only from Top Station, Pampadum Shola NP, by Dipu Karuthedathu. This distinct race is sometimes considered a split from the nominate of Himalayas and is endemic to Western Ghats and hill forests of Sri Lanka (Rasmussen & Anderton 2012). In Kerala, it appears to be widespread (Sashikumar *et al.* 2011a) but rare everywhere.

Nilgiri Wood-Pigeon *Columba elphinstonii*

Most sightings are from outside Eravikulam NP – just a single one from Varattukulam being from inside the park. Most observations of this Vulnerable endemic were from Anamudi Shola NP (Methappu), and Kurinjimala WLS (Neduvarpp).

Common (Northern) House Martin *Delichon urbica*

Though widespread elsewhere, this species is rare in Kerala with only a handful of sightings (Sashikumar *et al.* 2011a). Two sightings of four birds from Varattukulam, Eravikulam NP by MC Thajudeen is the only record from the survey.

Travancore Brown Rock (Long-billed) Pipit *Anthus similis travancoriensis*

Race endemic to the Western Ghats south of the Palakkad Gap,

two sightings of three birds recorded from Kolukkan in Eravikulam NP by Shashank Dalvi are the only records from the survey.

Nilgiri Pipit *Anthus nilghiriensis*

A very good population from the camps of Eravikulam Hut (50 birds recorded during transects), Poovar (53), and Kolukkan (80) in Eravikulam NP, apart from records from Varattukulam, Methappu, and Neduvarpp. Partial to wet grasslands. This is probably one of the last strongholds of this Vulnerable, endemic species (Robin *et al.* 2014).

Olive-backed Pipit *Anthus hodgsonii*

Rare winter visitor to the Western Ghats of Kerala (Sashikumar ***et al.*** 2011a), the only report was a sighting from Neduvarpp by Rangaswamy M.

[[Common (Siberian) Chiffchaff *Phylloscopus [collybita] tristis*]]

A bird suspected to have been this species was recorded by Ginu George and Rinaz Mohammed from Kadavari. The details provided by the observer (Ginu) mention a small active bird, giving a warbler-impression, seen on a bare branch of a small tree about 25 m away from the observers. Observations through binoculars (Pentax 8x43 DCF-SP) revealed a fully brown warbler (unlike Blyth's Reed's longer head), no greenish tinge, and light brownish wash on the under parts. Legs and bill were black. White supercilium extended behind the eyes. A small white/ buff crescent patch on the edge of the wings (alula) was also seen. The bird stayed in good view with excellent lighting in bare branches for a minute. The observers were quizzed for potentially confusing species like Tytler's *P. tytleri*- and Tickell's- Leaf Warblers *P. affinis* (no yellow or green tinge), Booted- *Iduna caligata* and Syke's- Warblers *I. rama* (all dark beak & legs) and the descriptions provided were clear enough to have eliminated these latter. None of the past sightings of Chiffchaff (Uthaman 1999; Sashikumar *et al.* 2011) from Eravikulam NP and Munnar Hills have been supported with photographs, as is the case with this one. We consider this species as provisional here.

Tytler's Leaf-Warbler *Phylloscopus tytleri*

Recorded from various camps in Eravikulam NP like Rajamala, Eravikulam Hut, and Kolukkan, and also from Top Station (Pampadum Shola NP). The first report of this species from Kerala was from Munnar (Harrap & Redman 1990), and subsequently others (Praveen 2007), including several visiting bird-watchers, have reported it. It appears that this 'Near-threatened' Leaf-Warbler winters in good numbers in the Munnar Hills.

Nilgiri (Scaly) Thrush *Zoothera [dauma] neilgherriensis*

Some works consider the distinctly plumaged race of the Western Ghats a separate species (Rasmussen & Anderton 2012); this bird is nowhere common and is restricted to certain pockets in the hills (Sashikumar *et al.* 2011a). Sightings of single individuals from Top Station by Dipu Karuthedathu and from Rajamala by Sandeep Das are the only reports from this survey. However, this species has been repeatedly sighted by visiting birdwatchers in the Munnar Hills and must surely be more widespread than its secretive habits reveal, being the main reason for not encountering it more often.

White-bellied Shortwing (Blue Robin) *Myiomela albiventris*

Recorded from all the camps except Methappu (where it must have been overlooked, as it's been recorded breeding there) indicating a good population overall. These hills are the best refuge for this 'Endangered' species in the entire Western Ghats (Robin & Sukumar 2002).

Kerala (Palani) Laughingthrush *Trochalopteron [fairbanki] fairbanki*

One of the common birds, seen in all ten camps. This region seems to houses a major population of this 'Near-threatened' taxon. The nominate race is a proposed split (Praveen & Nameer 2013) from the southern race of *meridionale*, and in view of this imminent status change, these hills will form the backbone of the global population.

Broad-tailed Grass-Warbler (Grassbird) *Schoenicola platyura*

This 'Vulnerable' yet secretive species was recorded only from the Kolukkan and Rajamala areas in Eravikulam NP. Grassy hilltops of the Munnar Hills are well known for this species, from where it is regularly reported by visiting birdwatchers.

Kashmir Flycatcher *Ficedula subrubra*

A first winter bird was recorded and photographed (Dalvi 2013) at the outskirts of Eravikulam NP, on the way to Eravikulam Hut. This was the first confirmed record of this 'Vulnerable' migratory species from the Western Ghats south of the Palakkad Gap.

Black-and-Orange Flycatcher *Ficedula nigrorufa*

This 'Near-threatened' species was recorded from all the camps and seems to be generally distributed everywhere in good numbers.

Black-throated (Jerdon's) Munia *Lonchura kelaarti jerdoni*

A flock of six birds was seen at Neduvarpp, being the only record for the survey. A bird of degraded grasslands and shrublands in the high-altitude region, this race is endemic to Western Ghats.

In terms of omissions, none of the high-altitude endemic species known from the Munnar Hills were missed out from the survey. However, about 20 species recorded during the previous survey at Eravikulam NP (Uthaman 1999) were not recorded this time. It is suspected that many of them could have been from sites outside the geographical boundaries of PAs and are marked in the checklist explicitly with a question mark.

Apart from this, some of the rare birds reported once or twice from the hills were not reported during the survey. These include Lesser Kestrel (Sashikumar *et al.* 2011a), Eastern Grass

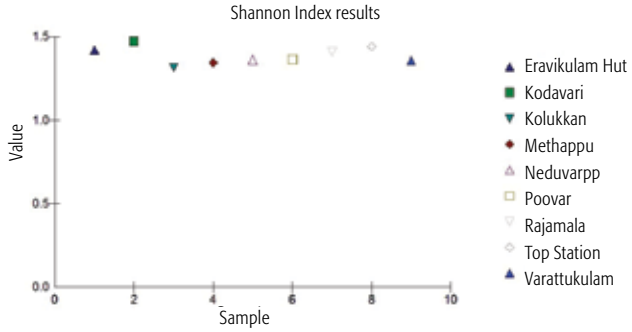

Fig. 2. Shannon's diversity index of basecamps

Owl (Sashikumar *et al.* 2011a), Eurasian Woodcock (Sashikumar *et al.* 2011a), Common Grasshopper Warbler (Sashikumar *et al.* 2011a), Eurasian Crag Martin (Sashikumar *et al.* 2011a, 2011b), and Pied Thrush (Jackson 1973; Sashikumar *et al.* 2011a).

Bird diversity

Bird diversity at the different base camps in the Munnar Hills is given in Table 3, Fig. 2. Highest species richness was recorded at Top Station (68), and Rajamala (68) base camps, while the maximum number of individual birds was also sighted at Top Station (1365). Shannon's Index is more or less the same across camps, indicating uniform bird diversity across the Munnar Hills.

Similarity of basecamps

Bray-Curtis Cluster Analysis of similarity among the bird taxa of different base camps from the Munnar Hills is given in Figs. 3 & 4. It shows that a checklist-based similarity analysis need not be similar to a population-based one; hence, surveys that estimate population are more useful for comparing similar habitats. Certain patterns are clearly evident from this analysis. Kolukkan and Eravikulam Hut camps are more similar than others with their intact grassland-shola habitat. Poovar is more similar to Eravikulam Hut & Kolukkan than others—again indicating similar habitats inside the national park. Top Station, with slightly diverse and disturbed high-altitude habitat is most divergent in terms of population. Varattukulam, though inside the national park, seems to have a great amount of edge effect and is dissimilar from the camps inside the core area of Eravikulam NP. Rajamala, with its high tourist influx, is also divergent from the three core camps—being more similar to Kadavari in Kurinjimala WLS in terms of population. Though checklist-wise Methappu is similar to Kadavari, this is not the case in terms of population. Neduvarpp is a strange case—though it is the most divergent of camps based on checklists, due to the excessive wattle plantations, it seems more similar to Methappu in terms of bird population. Hence, bird population patterns of camps like Methappu & Neduvarpp need more detailed study to understand their position.

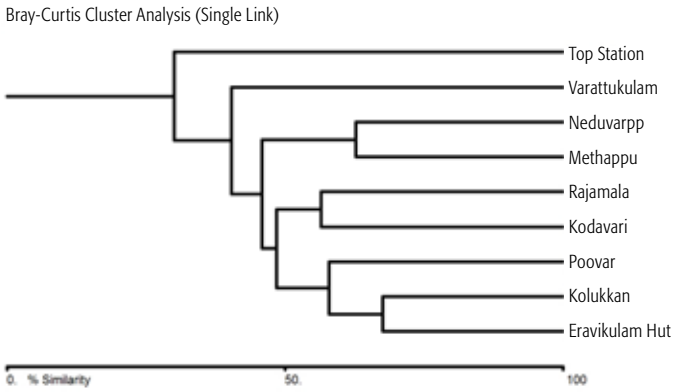

Fig. 3. Bray-Curtis cluster analysis of similarity based on population

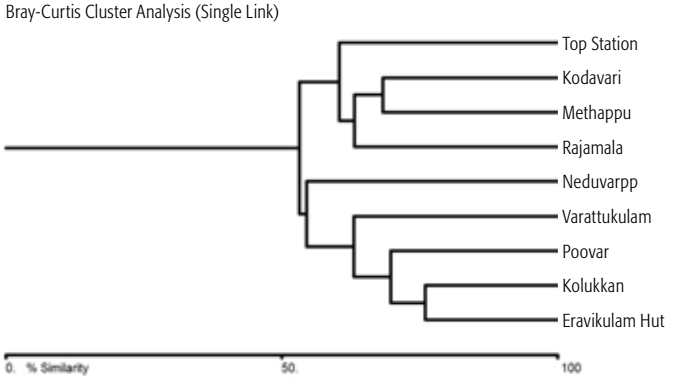

Fig. 4. Bray-Curtis Cluster analysis of similarity based on checklist

Feeding guild structure

The feeding guild structure throws open a lot of interesting facts about the birdlife of a place. Like elsewhere in the Western Ghats (Praveen & Nameer 2006, 2009), the most prominent guild that dominates the profile is 'Canopy-Insectivore' (41%) (Fig. 5, 6). However, 'Understory-Insectivores' (20%) and 'Terrestrial-Insectivores' (8%) are well represented in the Munnar Hills, which indicate a healthy ecosystem with low pesticide effects (Nameer & Praveen 2006). Quite interestingly, the 'Frugivores' (13%), and 'Nectarivore-Insectivore' (2%) guilds that are normally well represented in mid-altitude forests, are at much lower levels here. Other guilds represent a minority population of the forest birds.

IUCN's 'Threatened' / 'Near-Threatened' species

Ten 'Threatened' birds were recorded during the survey of which one is listed as 'Endangered' (EN), four "Vulnerable" (VU), and the remaining "Near-threatened" (NT) (Table 4) (BirdLife International 2014). The survey recorded extremely good numbers of Palani Laughingthrush (NT) from all over the hills. Nilgiri Pipit (VU) showed excellent population in Eravikulam NP and a reasonable population in Kurinjimala WLS. Robin *et al.* (2014) recently proposed uplisting the status of Nilgiri Pipit to "Endangered" based on their recent assessment of the distribution of this species across the Western Ghats and this would probably be the largest population of this species.

Nilgiri Flycatcher (NT) and Black-and-orange Flycatcher (NT) were present in both camps—however, interestingly, the latter showed a higher population—could Nilgiri Flycatchers be wintering at lower altitudes? Nilgiri Wood-Pigeon (VU) was found to be more common outside Eravikulam NP than inside, which is another strange observation as it was expected that the undisturbed sholas of Eravikulam plateau to be its stronghold vis-à-vis slightly degraded sholas outside it. Among the skulkers, the endangered White-bellied Blue Robin (EN) was also recorded from all the camps, however its 'abundance' may not make much sense as the actual sightings will be few for the bird.

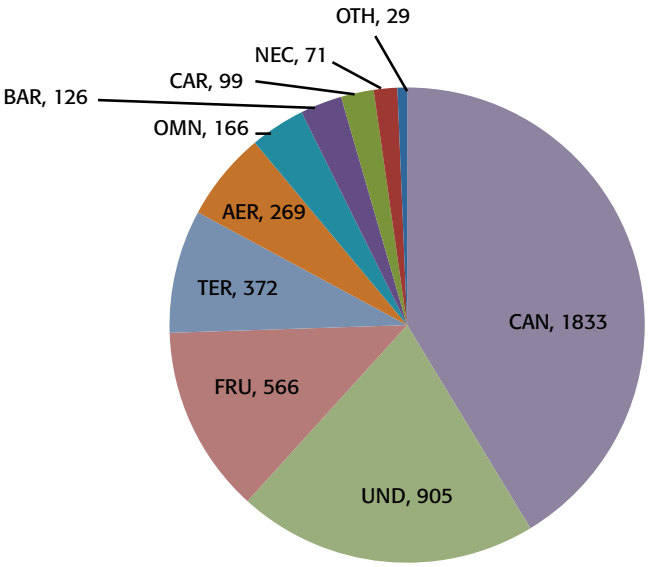

Fig. 5. Feeding guild structure of birds of Munnar Hills

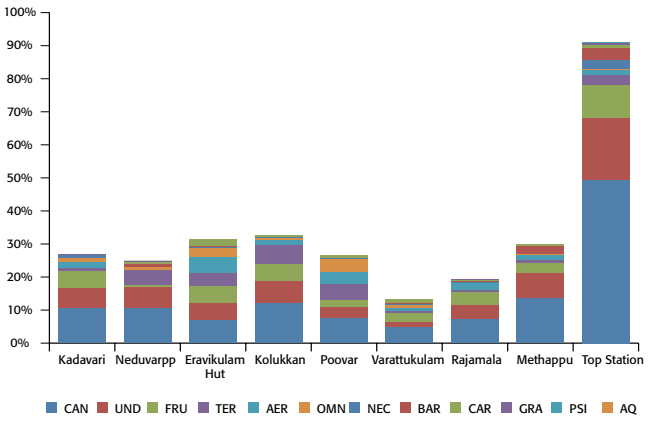

Fig. 6. Site-wise comparison of feeding guild structure of birds of Munnar Hills

Table 4. Frequency of sighting of threatened / near-threatened species

Species	IUCN	ENP	ASNP	PSNP	KWLS
Nilgiri Pipit	VU	189	2	0	15
Palani Laughingthrush	NT	128	81	153	54
White-bellied Blue Robin	EN	22	0	5	6
Black-and-orange Flycatcher	NT	16	11	23	17
Nilgiri Flycatcher	NT	16	1	9	2
Pallid Harrier	NT	11	0	0	0
Broad-tailed Grassbird	VU	7	0	0	0
Nilgiri Wood Pigeon	VU	1	11	2	7
Kashmir Flycatcher	VU	X	0	0	0
Tytler's Leaf Warbler	NT	X	0	X	0

Tytler's Leaf-Warbler (NT), one of the wintering warblers, was noted in a few camps but not during transects. The highlight of the survey, a first winter Kashmir Flycatcher (VU), was also not recorded during transects, but outside the time allotted to them (Dalvi 2013).

Western Ghats endemics

Eleven species of birds (out of 25) that are endemic to the Western Ghats have been reported from the Munnar Hills (Table 5). Apart from these, there are endemic races of eight species (Rasmussen & Anderson 2012). Unlike most mid-altitude forests in Kerala, Palani Laughing-thrush and Nilgiri Pipit are the most dominant endemics in Munnar Hills. The other high-altitude endemic birds such as Nilgiri Flycatcher, White-bellied Blue-Robin, and Black-and-orange Flycatcher are also well represented. It can be seen than the endemic density in undisturbed habitats like Eravikulam NP is higher than degraded habitats of Kurinjimala WLS (Fig. 7).

Robin *et al.* (2011) found a certain degree of cultural divergence in the song structure of White-bellied Blue-Robin in their samples from the Palani- and Grass- Hills. They attributed this to the recent deforestation in the intervening connecting areas of the Sky Islands (i.e., Munnar Hills). However, our study did not find any discontinuity in the shola habitats and its birds including Palani Laughingthrush, White-bellied Blue Robin and, Black-and-Orange Flycatcher—from Poovar in the north till Kadavari in the east. Poovar is contiguous with Grass Hills of Tamil Nadu while Kadavari lies adjacent to Palani Hills. More studies are required to check if any narrow barriers, probably man-made, like roads, break this seemingly continuous stretch.

Birds of prey

Twelve species of raptors were recorded from the Munnar Hills of which the grassland specialists—Common Buzzard, Pallid Harrier, and Common Kestrel dominated the list (Table 6). Frequency of raptor sightings in PAs in Eravikulam NP, with grasslands, is much more than other PAs and is probably the best habitat in Kerala.

Table 5. Frequency of sighting of Western Ghat endemic species and *subspecies*

Species	ENP	ASNP	PSNP	KWLS
Palani Laughingthrush	128	81	153	54
Square-tailed Bulbul	211	14	59	14
Nilgiri Pipit	189	2	0	15
Black-and-orange Flycatcher	16	11	23	17
Indian Scimitar Babbler	19	7	25	7
Nilgiri Flowerpecker	14	1	31	0
White-bellied Blue Robin	22	0	5	6
Nilgiri Flycatcher	16	1	9	2
Nilgiri Wood Pigeon	1	11	2	7
Crimson-backed Sunbird	5	0	1	10
Indian Blackbird	14	0	1	0
Greater Flameback	5	3	5	0
Broad-tailed Grassbird	7	0	0	0
White-bellied Blue Flycatcher	0	0	0	6
Long-billed Pipit	3	0	0	0
Dark-fronted Babbler	1	0	0	1
Nilgiri Thrush	1	0	1	0
Puff-throated Babbler	0	0	1	0
Red Spurfowl	0	0	2	2

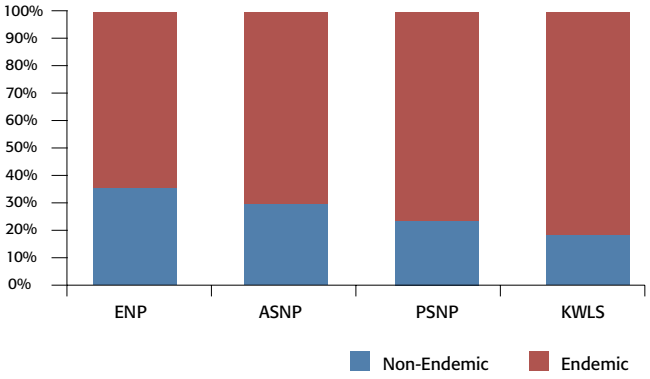

Fig. 7. Endemic vs Non-endemic species distribution

Table 6. Frequency of sighting of birds of prey

Species	ENP	ASNP	PSNP	KWLS
Common Kestrel	26	1	0	3
Common Buzzard	23	0	0	2
Pallid Harrier	11	0	0	0
Black eagle	2	0	4	0
Booted Eagle	4	0	0	1
Crested Goshawk	1	0	3	0
Black-winged Kite	2	0	1	0
Shikra	0	0	0	2
Crested Serpent Eagle	1	0	0	0
Rufous-bellied Hawk-Eagle	1	0	0	0
Changeable Hawk-Eagle	0	0	1	0
Short-toed Snake Eagle	0	0	0	1
Raptor sp.	1	0	3	0
Falcon sp.	0	3	0	0
Kite sp.	0	1	0	0
Harrier sp.	1	0	0	0

Ground birds

Ground birds are well represented in the Munnar Hills (Table 7). Of particular relevance is the excellent population of Nilgiri Pipit in Eravikulam NP and Kurinjimala WLS. Apart from this, the shola specialists like Indian Blackbird *Turdus simillimus bourdilloni* and White-bellied Blue Robin were well represented in all the camps. Elsewhere (Nameer & Praveen 2006), it has been noted that proximity of tea plantations can affect this guild negatively, apparently due to pesticide use.

Primary hole-nesting birds

Primary hole-nesting birds are ecologically significant birds and are regarded as keystone species as their services to the ecosystem are disproportionately large (Power *et al.* 1996). Their presence in an ecosystem is of great importance, as without them the secondary hole nesting birds would not be able to find enough cavities for nesting. Unlike most other forests, density of primary hole-nesting birds in high-altitude shola forests is quite patchy and there are only a few sightings of those (Table 8).

Table 7. Frequency of sighting of ground birds

Species	ENP	ASNP	PSNP	KWLS
Nilgiri Pipit	189	2	0	15
Grey Wagtail	20	6	35	42
White-bellied Blue-Robin	22	0	5	6
Grey Junglefowl	1	1	4	14
Indian Blackbird	14	0	1	0
Painted Bush Quail	7	0	0	0
Red Spurfowl	0	0	2	2
Long-billed Pipit	3	0	0	0
Blue-capped Rock Thrush	2	0	0	0
Indian Blue Robin	2	0	0	0
Nilgiri Thrush	1	0	1	0
Blue Rock Thrush	0	0	0	0
Forest Wagtail	0	0	1	0
Olive-backed Pipit	0	0	0	1

Table 8. Frequency of sighting of primary hole nesting species

Species	ENP	ASNP	PSNP	KWLS
White-cheeked Barbet	12	7	21	2
Greater Flameback	5	3	5	0
Common Flameback	3	0	1	0
Streak-throated Woodpecker	1	0	0	0
Woodpecker sp.	1	0	4	0
Flameback sp.	1	0	0	0

Brood parasites of birds

The abundance of parasitic cuckoos is an indicator of the breeding pressure exerted on its foster parents. A low abundance of brood parasites signifies lesser breeding pressure and healthier ecosystem for resident breeders (Brittingham & Temple 1983; Hoover & Brittingham 1993; Winfree 1999). As an example, pristine habitats like Silent Valley NP (Bashir & Nameer 1993) and Eravikulam NP (Uthaman 1999) hardly supports any parasitic cuckoo species while a disturbed habitat like Peechi-Vazhani WLS (Easa 1991; Santharam 2006; Nameer & Nirmal 2007), in Kerala, houses many species of parasitic cuckoos in good abundance. As a part of this survey, there were no parasitic cuckoos recorded from any of the camps—either in transects or otherwise—which is a treated as a good sign. Cuckoos are known to parasitise Laughingthrushes (Ali & Ripley 1987), and hence their total absence indicates the lack of pressure from them on the breeding success of its potential foster parents.

Conclusion

This is the first concerted effort to survey birds across several parts of the Munnar Hills apart from Eravikulam NP. The survey provided information on the continuity of habitat in the High Ranges. Together with the Grass Hills in the north and the Palani Hills in the east, the Munnar Hills form the core of the high altitude habitat south of the Palakkad Gap. Nilgiri Pipit and Broad-tailed Grassbird, both Vulnerable species, have one of its last strongholds in Eravikulam NP. Grassland management practices

at Eravikulam NP have to be tuned to their respective breeding seasons and their other habitat requirements.

The present study brings out the importance of conservation of grassland-shola ecosystem to conserve the highly threatened and endemic species that exist within it. The following recommendations need to be taken up for the management of these habitats.

- Wattle plantations have to be phased out in shola-grassland ecosystem in Kurinjimala WLS.
- Physical continuity of shola habitats has to be strengthened from Kurinjimala WLS and Eravikulam NP by bringing in adjacent areas of the Munnar Hills into the PA network of one of the protected areas.
- Long-term monitoring of five montane species, namely, Palani Laughingthrush, White-bellied Bush Robin, Black-and-Orange Flycatcher, Nilgiri Pipit, and Broad-tailed Grassbird should be done in these hills.
- Automatic call recording equipment can be installed in select sites across the shola-grassland stretch to monitor White-bellied Blue-Robin and Palani Laughingthrush. The devices record a certain number of hours of forest sounds in morning and evening and they can be analysed offline to estimate density.
- A survey of this kind should be repeated every five years.

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Appendix. Checklist of birds of Protected Areas in Munnar Hills (based on IOC 4.3 Master List)

Common English Name	Species	HUT	VAR	KOL	POV	RAJ	MET	KAD	NED	TOP	ENP	KWLS	ANSP	PSNP	UTH	OTH
Painted Bush Quail	*Perdicula erythrorhyncha*					7					X				X	
Red Spurfowl	*Galloperdix spadicea*								2	2		X	X			
Grey Junglefowl	*Gallus sonneratii*	X		X		1	1	1	13	4	X	X	X	X	X	
Indian Pond Heron	*Ardeola grayii*									1			X			
Black-winged Kite	*Elanus caeruleus*	1	1						X	1	X	X	X		X	
Crested Honey Buzzard	*Pernis ptilorhynchus*								X			X			X	
Jerdon's Baza	*Aviceda jerdoni*															BOK
Crested Serpent Eagle	*Spilornis cheela*		1								X				X	
Short-toed Snake Eagle	*Circaetus gallicus*								1			X			X	
Changeable Hawk-Eagle	*Nisaetus cirrhatus*									1			X			
Legge's Hawk-Eagle	*N. kelaarti*									X			X			
Rufous-bellied Hawk-Eagle	*Lophotriorchis kienerii*		1								X				X	
Black Eagle	*Ictinaetus malaiensis*	2				X				4	X		X			
Booted Eagle	*Hieraaetus pennatus*	1		2		1		1			X	X				
Bonelli's Eagle	*Aquila fasciata*															ELD
Crested Goshawk	*Accipiter trivirgatus*	1								3	X		X		X	
Shikra	*A. badius*								2			X				
Pallid Harrier	*Circus macrourus*	2	6	2	1						X				X	
Common Buzzard	*Buteo buteo*	14	X	1	6	2	X		2	X	X	X	X	X	X	
Eurasian Woodcock	*Scolopax rusticola*															BOK
Green Sandpiper	*Tringa ochropus*							X				X			X	
Rock Dove	*Columba livia*							2				X				
Nilgiri Wood Pigeon	*C. elphinstonii*	X	1	X		X	11		7	2	X	X	X	X	X	
Spotted Dove	*Spilopelia chinensis*			1							X					
Grey-fronted Green Pigeon	*Treron affinis*															MAN
Green Imperial Pigeon	*Ducula aenea*									1			X			
Mountain Imperial Pigeon	*D. badia*					X			1		X	X			X	
Greater Coucal	*Centropus sinensis*						1	3		1		X	X	X	X	
Lesser Coucal	*C. bengalensis*														X	
Eastern Grass Owl	*Tyto longimembris*															BOK
Brown Fish Owl	*Ketupa zeylonensis*									X			X		X	
Brown Wood Owl	*Strix leptogrammica*									X			X			
Jungle Nightjar	*Caprimulgus indicus*															ELD
Jerdon's Nightjar	*C. atripennis*														X	
Indian Swiftlet	*Aerodramus unicolor*					X	4				X			X		
White-rumped Spinetail	*Zoonavena sylvatica*	X		X			8				X			X	X	
Brown-backed Needletail	*Hirundapus giganteus*					X					X				X	
Alpine Swift	*Tachymarptis melba*	8	7								X				X	
Blyth's Swift	*Apus leuconyx*														X	
Little Swift	*A. affinis*						X							X		
Malabar Trogon	*Harpactes fasciatus*						1			3			X	X	X	
White-throated Kingfisher	*Halcyon smyrnensis*									X			X			

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Common English Name	Species	HUT	VAR	KOL	POV	RAJ	MET	KAD	NED	TOP	ENP	KWLS	ANSP	PSNP	UTH	OTH
Common Kingfisher	*Alcedo atthis*									2			X			
Green Bee-eater	*Merops orientalis*									X			X			
Chestnut-headed Bee-eater	*M. leschenaulti*														X	
Eurasian Hoopoe	*Upupa epops*			X							X					
White-cheeked Barbet	*Megalaima viridis*	4	2		4	2	7	2		21	X	X	X	X	X	
Speckled Piculet	*Picumnus innominatus*					X				X	X		X			
Brown-capped Pygmy Woodpecker	*Dendrocopos nanus*															MAN
Lesser Yellownape	*Picus chlorolophus*														X	
Streak-throated Woodpecker	*P. xanthopygaeus*					1					X				X	
Common Flameback	*Dinopium javanense*		1	1		1			X	1	X	X	X			
Greater Flameback	*Chrysocolaptes guttacristatus*	5					3	X		5	X	X	X	X	X	
Lesser Kestrel	*Falco naumanni*															BOK
Common Kestrel	*F. tinnunculus*	9	6	2	9	X	1	2	1	X	X	X	X	X	X	
Peregrine Falcon	*F. peregrinus perigrinator*															PO1
Bar-winged Flycatcher-shrike	*Hemipus picatus*					3	9	3	X	28	X	X	X	X	X	
Malabar Woodshrike	*Tephrodornis sylvicola*															MAN
Orange Minivet	*Pericrocotus flammeus*					1		10		16	X	X	X		X	
Brown Shrike	*Lanius cristatus*														X	
Long-tailed Shrike	*L. schach*						1	14		5		X	X	X		
Black-naped Oriole	*Oriolus chinensis*									1			X			
Ashy Drongo	*Dicrurus leucophaeus*			X						5	X		X		X	
Asian Paradise Flycatcher	*Terpsiphone paradisi*					X		3			X	X			X	
House Crow	*Corvus splendens*									1			X			
Indian Jungle Crow	*C. culminatus*	39	13	11	62	2	1	12	12	5	X	X	X	X	X	
Grey-headed Canary-flycatcher	*Culicicapa ceylonensis*	36	20	37	59	13	49	35	10	161	X	X	X	X	X	
Cinereous Tit	*Parus cinereus*						1							X	X	
Indian Black-lored Tit	*Machlolophus aplonotus*		1			4	X	X	8	22	X	X	X	X		
Oriental Skylark	*Alauda gulgula*	2		1	16						X				X	
Malabar Lark	*Galerida malabarica*															BOK
Red-whiskered Bulbul	*Pycnonotus jocosus*	11	1	X	16	27	14	53		38	X	X	X	X	X	
Red-vented Bulbul	*P. cafer*							12				X				
Yellow-browed Bulbul	*Acritillas indica*									28			X		X	
Square-tailed Bulbul	*Hypsipetes ganeesa*	65	35	73	11	27	14	10	4	59	X	X	X	X		
Hill Swallow	*Hirundo domicola*	45	5	19	52	28	15	29		24	X	X	X	X	X	
Eurasian Crag Martin	*Ptyonoprogne rupestris*															BOK
Dusky Crag Martin	*P. concolor*														X	
Common House Martin	*Delichon urbicum*		4								X					

Appendix. Checklist of birds of Protected Areas in Munnar Hills (based on IOC 4.3 Master List)

Common English Name	Species	HUT	VAR	KOL	POV	RAJ	MET	KAD	NED	TOP	ENP	KWLS	ANSP	PSNP	UTH	OTH
Red-rumped Swallow	*Cecropis daurica*	20	X								X				X	
Streak-throated Swallow	*Petrochelidon fluvicola*														X	
Tickell's Leaf Warbler	*Phylloscopus affinis*	3		17	13	4	3	23	8	12	X	X	X	X	X	
Greenish Warbler/ Green Warbler	*P. trochiloides/nitidus*	15		25	9	11	41	24	26	70	X	X	X	X		
Large-billed Leaf Warbler	*P. magnirostris*	4		19		4	8	12	21	40	X	X	X	X	X	
Tytler's Leaf Warbler	*P. tytleri*	X		X		X				X	X		X			
Western Crowned Warbler	*P. occipitalis*			1						2	X		X		X	
Blyth's Reed Warbler	*Acrocephalus dumetorum*				11	X	2	1		20	X	X	X	X	X	
Thick-billed Warbler	*Iduna aedon*														X	
Common Grasshopper Warbler	*Locustella naevia*															BOK
Broad-tailed Grassbird	*Schoenicola platyurus*			X		7					X				X	
Zitting Cisticola	*Cisticola juncidis*															ELD
Grey-breasted Prinia	*Prinia hodgsonii*					X					X					
Jungle Prinia	*P. sylvatica*					X		X	18		X	X			X	
Ashy Prinia	*P. socialis*								2	8		X	X		X	
Plain Prinia	*P. inornata*	X	X	1	6	1	1	1			X	X		X	X	
Common Tailorbird	*Orthotomus sutorius*			X							X					
Indian Scimitar Babbler	*Pomatorhinus horsfieldii*	4	10	2		3	7	2	5	25	X	X	X	X	X	
Tawny-bellied Babbler	*Dumetia hyperythra*														X	
Dark-fronted Babbler	*Rhopocichla atriceps bourdilloni*					1			1		X	X				
Brown-cheeked Fulvetta	*Alcippe poioicephala*	5		6			1			24	X		X	X	X	
Puff-throated Babbler	*Pellorneum ruficeps*					X				1	X		X		X	
Rufous Babbler	*Turdoides subrufa*														X	
Wynaad Laughingthrush	*Garrulax delesserti*					X					X				X	
Palani Laughingthrush	*Trochalopteron f. fairbanki*	26	12	57	7	26	81	9	45	153	X	X	X	X	X	
Oriental White-eye	*Zosterops palpebrosus*	34	38	68	25	58	82	44	77	290	X	X	X	X	X	
Asian Fairy-bluebird	*Irena puella*					X				16	X		X			
Velvet-fronted Nuthatch	*Sitta frontalis*	2	2			1	34		18	44	X	X	X	X	X	
Southern Hill Myna	*Gracula indica*					2				9	X		X			
Jungle Myna	*Acridotheres fuscus*							3				X				
Pied Thrush	*Geokichla wardii*															BOK
Nilgiri Thrush	*Zoothera neilgherriensis*					1				1	X		X			
Bourdillon's Blackbird	*Turdus simillimus bourdilloni*	8		5	1	X	X			1	X		X	X	X	
Oriental Magpie-Robin	*Copsychus saularis*									2			X			
Asian Brown Flycatcher	*Muscicapa latirostris*									2			X			
Brown-breasted Flycatcher	*M. muttui*														X	
Rusty-tailed Flycatcher	*M. ruficauda*								1			X			X	

Appendix. Checklist of birds of Protected Areas in Munnar Hills (based on IOC 4.3 Master List)

Common English Name	Species	HUT	VAR	KOL	POV	RAJ	MET	KAD	NED	TOP	ENP	KWLS	ANSP	PSNP	UTH	OTH
White-bellied Blue Flycatcher	*Cyornis pallipes*					X		6			X	X			X	
Tickell's Blue Flycatcher	*C. tickelliae*															MAN
Verditer Flycatcher	*Eumyias thalassinus*		2							1	X		X		X	
Nilgiri Flycatcher	*E. albicaudatus*	2		3	7	4	1		2	9	X	X	X	X	X	
Indian Blue Robin	*Larvivora brunnea*					2					X				X	
White-bellied Blue Robin	*Myiomela albiventris*	1	4	9	1	7	X	5	1	5	X	X	X	X		
Malabar Whistling Thrush	*Myophonus horsfieldii*		2	1	2	1	3	5		2	X	X	X	X	X	
Kashmir Flycatcher	*Ficedula subrubra*										X					
Black-and-orange Flycatcher	*F. nigrorufa*	2	4	5	2	3	11	11	6	23	X	X	X	X		
Blue Rock Thrush	*Monticola solitarius*					X					X				X	
Blue-capped Rock Thrush	*M. cinclorhynchus*					2					X				X	
Siberian Stonechat	*Saxicola maurus*			X							X					
Pied Bush Chat	*S. caprata*	39	5	24	20	16	15	42	21	9	X	X	X	X	X	
Golden-fronted Leafbird	*Chloropsis aurifrons*															MAN
Thick-billed Flowerpecker	*Dicaeum agile*		1								X				X	
Nilgiri Flowerpecker	*D. concolor*	6	5	3		X	1		X	31	X	X	X	X	X	
Crimson-backed Sunbird	*Leptocoma minima*			1	1	3		10		1	X	X	X		X	
Little Spiderhunter	*Arachnothera longirostra*															MAN
Black-throated Munia	*Lonchura kelaarti*							X	6	X		X	X			
Forest Wagtail	*Dendronanthus indicus*									1			X			
Grey Wagtail	*Motacilla cinerea*	4	X	5	6	5	6	6	36	35	X	X	X	X	X	
White-browed Wagtail	*M. maderaspatensis*						1	5		3		X	X	X		
Paddyfield Pipit	*Anthus rufulus*														X	
Long-billed Pipit	*A. similis*			3							X				X	
Olive-backed Pipit	*A. hodgsoni*								1			X			X	
Nilgiri Pipit	*A. nilghiriensis*	50	6	80	53	X	2		15		X	X		X	X	
Common Rosefinch	*Carpodacus erythrinus*					7	X			11	X		X	X	X	

Legend: HUT: Eravikulam Hut, VAR: Varattikulam, KOL: Kolukkan, POV: Poovar, RAJ: Rajamala, MTH: Methappu, KAD: Kadavari, NED: Neduvarpp, TOP: Top Station, ENP: Eravikulam NP, KWLS: Kurinjimala WLS, ASNP: Anamudi Shola NP, PSNP: Pampadum Shola NP, ENP97: Uthaman (1999), OTH: Other Reference, BOK: Sashikumar et al. (2011a), MAN: Nameer (2005), ELD: K. V. Eldhose pers. comm. September 2014

Kite flying: Effect of *Chinese manja* on birds in Bangalore, India

Sharat Babu, S. Subramanya & Mohammed Dilawar

Babu, S., Subramanya, S., & Dilawar, M., 2015. Kite flying: Effect of *Chinese manja* on birds in Bangalore, India. *Indian BIRDS* 10 (1): 13–18.
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Abstract

Flying kites during the Indian festival of *Makar Sankranti* has been an age-old tradition. This pastime has increased in popularity tremendously, and even taken a competitive turn in the past few decades. In recent years, the use of kite-flying threads has evolved from traditional cotton threads to nylon, or synthetic string, popularly called *Chinese manja*. During the sport of kite-flying, the aim is to cut the string of another airborne kite, by entangling their strings and allowing friction to wear away one. When the string of a kite is severed midway, it drops down along with the kite, and gets intertwined in the branches of trees, on tall buildings, and other tall man-made structures. Often birds get inextricably entangled in these manja strings and endup suspended from them, some at great heights, and / or get injured to various degrees, eventually dying, if not rescued by human intervention.

The present study discusses the effect of such jumbled manja strings on the birdlife in Bangalore, and analyses records, of rescue attempts of such avian victims, maintained since 2010 at the *Bruhut Bangaluru Mahanagara Palike* (=Greater Bangalore Municipal Corporation). A total of 268 birds comprising 10–13 species were rescued. These birds sustained various degrees of injuries due to which a few eventually succumbed. In many of the instances, the entangled and dangling birds had to be rescued manually, as the fire brigade's ladder could not reach the required height. Most of the birds were released after rescue. Some required basic medical treatment, while others required prolonged treatment, care, and a recovery period. While small birds were not affected, the effect of the manja was telling on the larger birds, with Black Kites *Milvus migrans*, and crows (*Corvus* spp.) being prime victims. Remedies to overcome this menace are discussed.

Introduction

The festival of *Makar Sankranti* is celebrated all over India during the third week of January with great gaiety. Traditionally, the flying of kites has been an integral part of the festive celebrations (Bareth 2003; Prakash 2003; Anonymous 2012; Soumya 2013; Wikipedia 2013). During the festival, people fly kites of different sizes and shapes. The focus of this sport and pastime is to fly one's kite into another flying close-by, and try and cut the string of that kite so that it falls from the sky. The string used to fly kites is popularly called, '*Manja*'. During these kite-flying events, the kite flyers seek strings that are made of a strong thread, so that the strings of other kites can be cut easily when engaged in a mid-air duel. In recent times, the traditional cotton threads that were used as *manja* have been replaced by much cheaper and stronger *Chinese manja* (NDTV 2011; Anonymous 2012). *Manja* can injure birds when they collide against it in mid air, and they may even suffer death due to the severity of the injuries sustained; *manja* can be fatal to human lives too (Bareth 2003; Prakash 2003; Anonymous 2012; Beauty Without Cruelty 2013; Soumya 2013). During *Sankranti*, in cities like Jaipur in Rajasthan, and Ahmedabad in Gujarat, the whole sky is filled with kites—a million or more kites are known to dot the sky at the same time—each trying to joust with neighbouring kites. This goes on all day, from before sunrise to after sunset (A. Prakash, *verbally*).

Once the string of a rival kite is severed (the length of the string could vary from a couple of centimeters to several meters), it gets wind-blown and drifts along with the kite and settles or gets caught on tall trees or tall protruding artifical structures like electricity or telegraph poles and protruberances on tall buildings. As a result of the breeze, the kite strings too get twisted firmly on to the branches in the canopy or on other structures, wherever the kite settles. Being practically invisible, these suspended strings prove quite harmful to birds that get entangled in them while in flight (Chetan 2011, 2012, 2013; Vattam 2011). When these birds try to wriggle free of them, struggling in shock, they get further entrapped. Such trapped birds remain dangling from trees and other substrates for various periods of time until spotted by people. They undergo enormous stress and strain, may get maimed, or even die, if not rescued.

This paper examines the harmful effects of such severed kite strings that get entangled on trees, electricity poles, tall buildings, *etc.,* on birds, in an urban set-up like Bangalore. We explore this by examining the database of all rescue attempts maintained by the *Bruhut Bangaluru Mahanagara Palike* (the Greater Bangalore Municipal Corporation; henceforth, BBMP).

Methods

Kite flying is practiced in Bangalore mainly during summer, from March to May, but not with such an intensity and fervour as in other Indian cities. According to one of the BBMP bird rescue volunteers, more kites are flown in Bangalore during summer than during the Sankranti festival (M. Rajesh Kumar, verbally,

2013). Also, we do not discount kites flown sporadically, on other occasions, throughout the year.

Between 2010 and 2014, details on birds found entangled in kite-flying thread were reported by the general public to BBMP, or the information was relayed to BBMP from other agencies in the city. After conducting a rescue operation, a report was filed with the BBMP by the rescue volunteer. Records of all such bird rescues have been maintained by the BBMP Forest Cell in a database, since 2010. This database was used, in the present study, to discern any noticeable patterns, to discuss the effect of such entangled strings on the bird-life in Bangalore, and to present an analysis of these rescue records.

The rescue process

As soon as the public notice any bird dangling from manja strings, they usually contact the police department's control room, the fire brigade, or the website: www.justdial.com. The call is then directed to BBMP's Forest Cell Helpline, and BBMP gathers information on the condition and location of the bird. The caller is then directed to one of the designated Zonal Volunteers. The volunteer reaches the spot in about 30 minutes. He assesses the situation and the resources required for a rescue operation. If the struggling bird is within his reach, the bird is rescued immediately, or he may enlist the help of local people, mainly a local tree climber. However, if the situation proves to be a difficult one, the fire brigade is contacted for a sky-ladder and, if there are power lines in the way, the Bangalore Electricity Supply Company (BESCOM) is requested to disconnect the electricity supply in the area for safety. The bird is then rescued. On an average such an operation takes approximately two to four hours, based on the complexity of the situation.

After the is rescued, the volunteer assesses its condition, releasing it immediately if it is uninjured and fit to fly. Efforts are made to de-stress the bird by covering its eyes with a cloth, so that the bird does not struggle further and suffer injuries or damage its body parts; then the manja strings that are wrapped around it are carefully cut and removed. If a bird is injured, it is wrapped in a cloth, placed in a cardboard box, and shifted to the BBMP Rescue and Rehabilitation Centre. If it has suffered grievous injuries, it is provided veterinary care, including surgery, if necessary. Such birds are held in the BBMP's rehabilitation centre till they recover and are fit to fly free. A report is duly filed with the BBMP Forest Cell on the outcome of the rescue and other related details.

Results & discussion

Between November 2010 and June 2014, there were 250 instances of birds being trapped in *Chinese manja* strings in the city of Bangalore. These comprised 268 birds belonging to about 10–13 species (Table 1; Fig. 1). BBMP volunteers and other associated agencies rescued them (N=250 instances; Table 2). Among the birds that were rescued, Black Kites were the single most commonly affected species making up nearly 70% of the birds found dangling from manja stings. From the data collected, it was also found that there was a strong correlation between the size of a bird and its chance of getting entangled in manja strings; larger birds, e.g., kites, showed a greater incidence of such possibilities (Fig. 2; Table 1). Although the sample size was not very large (N=268), birds smaller than a White-throated Kingfisher *Halcyon smyrnensis*, which is slightly smaller than a Common Myna *Acridotheres tristis*, were not found entangled in manja strings. This could be due to the fact that the smaller birds were able to see these strings better and avoided the strings, or that people failed to notice smaller birds thus entangled. We also feel that, this may be a situation peculiar to Bangalore, and different from that in other Indian cities, where kite flying is prevalent, depending on the nature of the urban environment and habitat complexities.

Table 1. Birds found entangled in *Chinese Manja* strings*

Species	Number
Black Kite *Milvus migrans*	182
Crow† *Corvus* spp.	39
Rose-ringed Parakeet *Psittacula krameri*	11
Rock Pigeon *Columba livia*	8
Barn Owl *Tyto alba*	3
Asian Koel *Eudynamys scolopaceus*	2
Egret†*Bubulcus* sp. & *Egretta* spp.	2
Myna† *Acridotheres* spp.	1
Brahminy Kite *Haliastur indus*	1
White-throated Kingfisher *Halcyon smyrnensis*	1
Unidentified†	18
Total	268

Notes
*More than one bird rescued in some instances or location.
†Species' identities could not be ascertained from the volunteers: Possible species include, *Corvus splendens, C. culminatus, Acridotheres tristis, A. fuscus, Bubulcus coromandus, and Egretta garzetta.*

From Fig. 1, it can be seen that a great majority of the birds entangled in manja strings were rescued from the centre of the city, and not its outskirts. The distribution of rescues also indicates that this is not a function of the availability of volunteers in a particular locality, as the volunteers had a much wider distribution (Fig. 1). Thus, we believe that this concentration of birds being affected by manja strings in the centre of the city is due to the fact that these areas happen to be part of old, densely-populated residential localities of Bangalore city where kites are flown traditionally from roof-tops, and with a greater intensity and concentration, than is done on the city's outskirts. This seems to be the case in other cities as well (e.g., Hyderabad, Soumya 2013).

Table 2. Agencies involved in the rescue of birds entangled in manja strings in Bangalore (N=250).

Mode of Recue	Percentage
BBMP FC Volunteer	60.16
BBMP FC Volunteer and fire brigade	24.70
BBMP FC Volunteer and help of locals	6.77
BBMP FC Volunteers, fire brigade, and YMCA	0.40
BBMP FC Volunteer and Mantri mall hydraulic ladder	0.40
BBMP FC Volunteer, fire brigade, rock climbers	0.40
BBMP FC Volunteer, Bescom, fire brigade	0.80
Fire brigade and BESCOM	0.80
Fire brigade	2.79
BESCOM	0.80
Local people	1.99

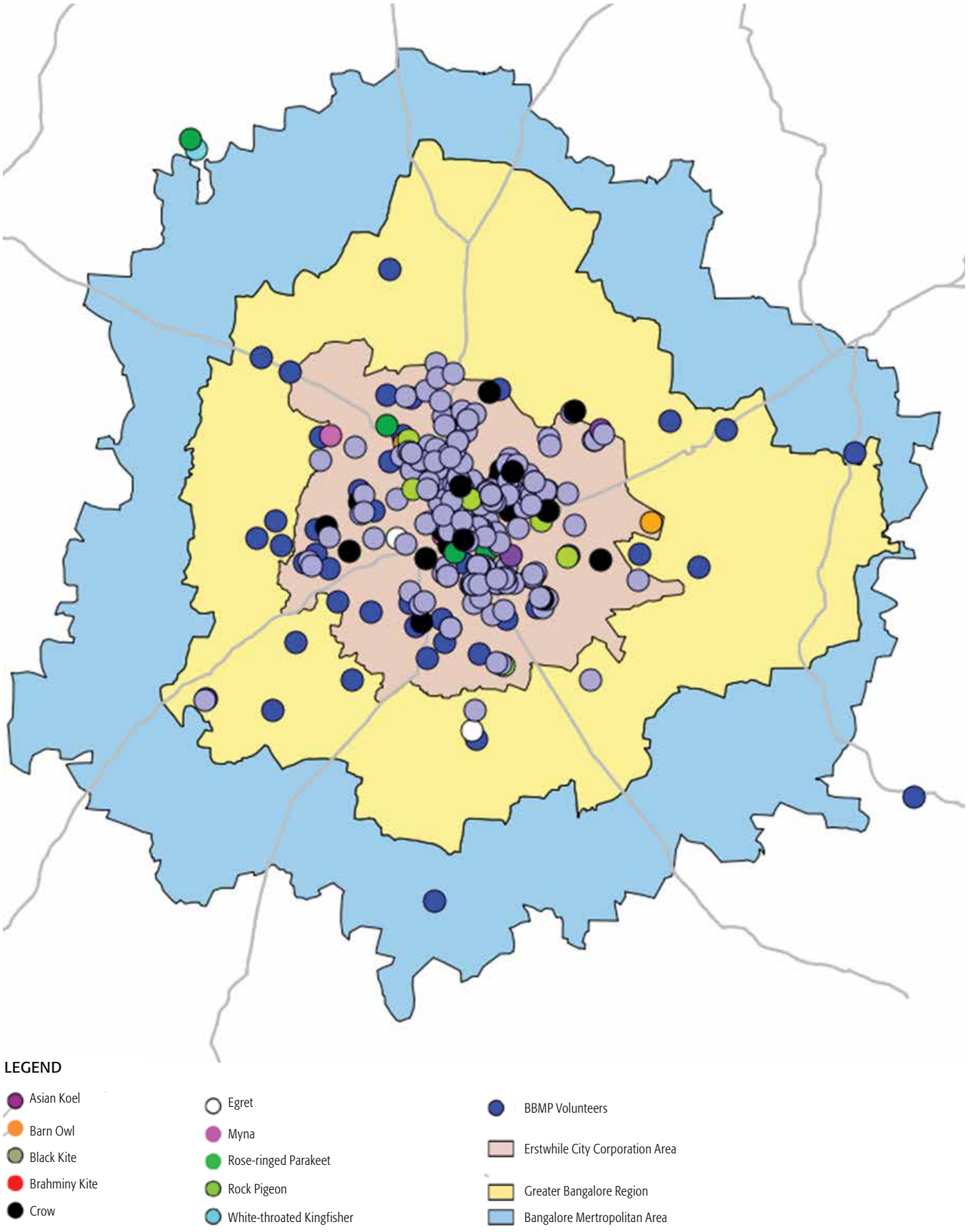

Fig. 1. Locations of birds rescued from manja strings in Bangalore (N=250).

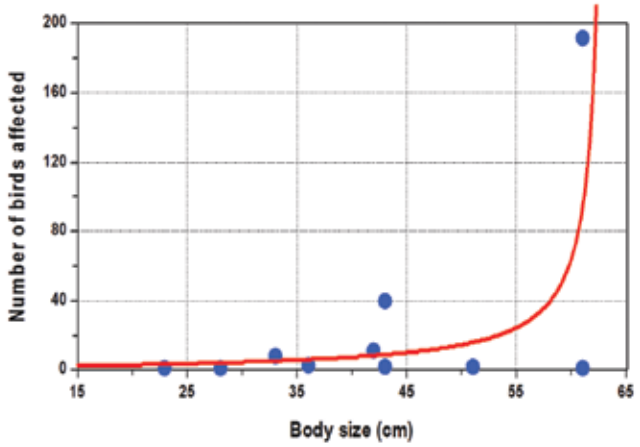

Fig. 2. Relationship between body size of birds and the number of birds found entangled in themanja strings (N=250).

It was also found that even though kites were mostly flown during summer, and less frequently at other periods of the year, birds suffered from the presence of severed manja strings throughout the year (Fig. 3). We suspect that the main reason for this is the greater durability of *Chinese manja* strings than traditionally used cotton strings, and that the former was not as easily biodegradable as the latter, and remained in the environment much longer, even beyond the kite-flying season (Soumya 2013), thus presenting a greater danger and lasting threat to birds in the city.

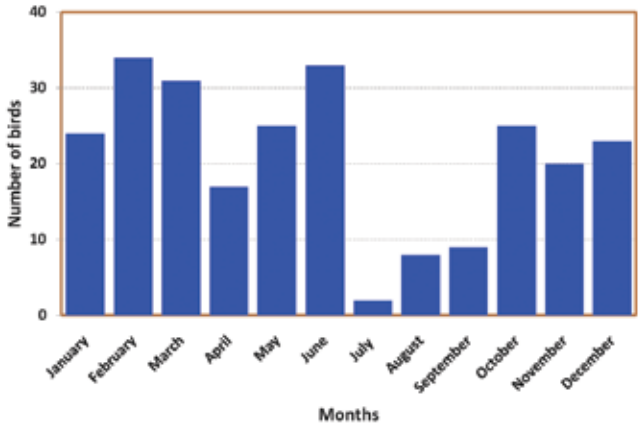

Fig. 3. Seasonality of birds found entangled in manja strings (N=250).

The average height at which birds were found suspended from manja strings was 12 m (Fig. 4), even though these affected birds were rescued from heights spanning 6–46 m above the ground. This variation could very well be peculiar to the urban habitat situation and a function of the substrates where the manja strings were entangled after being severed after kite-flying duels.

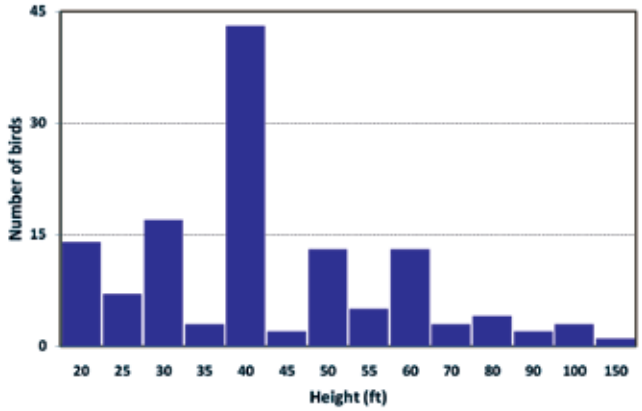

Fig. 4. Details of heights at which birds were found dangling from manja strings (N=130).

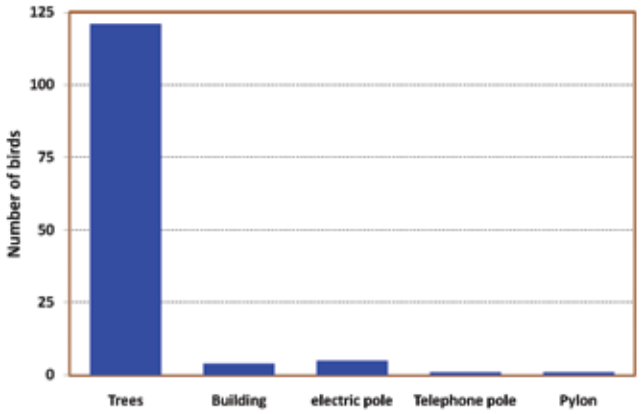

Fig. 5. Details of the substrates from which birds were found dangling from manja strings (N=132).

Over 90% of the birds were rescued from trees, where they must have got entangled when they flew into the canopy (Fig. 5). This also indicates that there is a greater likelihood of manja strings getting entangled in trees and thus posing a threat to birds.

From the rescue data available with BBMP, it is quite evident that more than one agency is involved in bird rescue attempts in Bangalore (Table 2; Chetan 2011, 2012, 2013; Vattam 2011). However, over 90% of the rescue attempts were handled by BBMP volunteers, making it the nodal agency involved in saving birds affected by manja strings in Bangalore. The rescue process clearly indicates that all the different agencies that were involved, worked in coordination with BBMP in most of their bird rescue attempts. We consider this as a unique model, where a city municipal corporation takes charge of the bird rescue and rehabilitation issues, and we would like to see this model being replicated in other cities across the country with a networking process similar to that in practice at Bangalore.

In Memoriam

ZAFAR RASHID FUTEHALLY
(1920–2013)


1

Spools of Chinese Manja available in local Market


2

Kite flying in Bangalore


3

A House Crow entangled in Manja string


4

A Black Kite entangled in Manja string Kite flying: a festive passion


5

Dead pigeon hanging: a victim of Chinese manja


6

A special rescue vehicle of the Bangalore Fire Brigade


7

A rescue in progress


8

Maimed leg of a kite following manja entanglement


9

A Black Kite injured by Manja strings being cared for

Plate 1. The problem of Chinese Manja on birds: their rescue, injuries, and death.

At present, these rescue attempts are being carried out in other cities by various agencies or individuals (Bareth 2003; Beauty Without Cruelty 2013; Soumya 2013). Towards this, there is a need to create a 'wildlife rescue and rehabilitation cell' within the city's municipal corporation with dedicated rescue staff and necessary infrastructure to handle such wildlife-related distress situations. A government directive already exists, under the Prevention of Cruelty to Animals Act, 1960, of the Ministry of Social Justice and Empowerment, Government of India (undated), which empowers every District Collector / Commissioner to set-up a local Society for Prevention of Cruelty to Animals (SPCA) at district level, of which he / she will be the Chairperspon. Thus, the care and rehabilitation of birds injured by manja strings can be entrusted to SPCA.

However, when one looks at the outcome of the bird rescue attempts, it is clearly seen that a small percentage of the birds entangled in kite strings end-up in prolonged care or even succumb (Table 3). Such birds may have remained entangled for long periods of time, which, in the case of a rescued Black Kite, was for about five days! In another rescue attempt, it took about 22 hrs for 32 men to rescue a Black Kite dangling from manja string (Chetan 2012). In an effort to reduce this time gap between entanglement and rescue, there is a need for a greater push for public education through a sustained campaign in the

Table 3. Outcome of the bird rescue attempts

Outcome after rescue	Number
Bird euthanized	1
Bird released immediately after rescue	216
Birds treated on the spot and released	8
Bird under prolonged care	10
Self release	1
Could not rescue	6
Bird Died	5
Nodata	3
Total	250

print and electronic media, detailing the life-threatening effects of severed kite strings, and also a campaign against the use of *Chinese manja* for kite-flying. Citizens should be urged to look for birds in distress, to promptly inform agencies like BBMP, and to aid in their rescue attempts.

The way forward

Considering the harmful effects of *Chinese manja* on free flying birds, and the consequent fatalities that they might suffer, we support and advocate a total ban on the use of *Chinese manja* for flying kites during different festivals or other seasons across the country. However, the very fact that the *Chinese manja* remains in the environment for a much longer period, is of great concern, and a good enough reason for proposing a ban on a wider scale across the country. It appears that *Chinese manja* has been banned in a few cities (NDTV 2011; Beauty Without Cruelty 2013; Soumya 2013), but such a ban is not enforced in all the states in the country. Now we learn that Maharashtra has banned 'manja' kite strings (PTI 2015). In Gujarat, local legislation restricts people from flying kites both, in the mornings, and evenings, when birds are most active (Gujarat Government Order No.ENV-10-2009-400 dated 12/12/2011). Nevertheless, there needs to be a greater level of law enforcement across the country, to prohibit this malady, and there needs to be proper policy for a country-wide ban on the use of *Chinese manja***.** Also, the ban on *Chinese manja* should not just be restricted to its sale and use, but should prevent its very manufacture within, and its import into the country.

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Editorial

Over a year ago we had announced of, and received manuscripts for, a special issue of *Indian BIRDS* on 'urban birds'. Due to various reasons beyond our control, this special issue has got inordinately delayed. We've now decided to publish manuscripts as and when they get ready, instead of bringing out a collective issue. The first of these is on the deleterious effects of kite flying on birds.

For every Indian child, the ability to fly a kite is one of the many rites of passage towards adulthood. Who among us has not been thrilled when the kite soared in the sky, straining at the string that held it back? Did we control the kite, or did the breeze? But the sport held our emotions; exultation when we cut a neighbouring kite after an aerial joust; disappointment, if our kite fell victim to another. And there were moments of grace when the world comprised wind, kite, and the kite-flyer. Who would have thought that a time would come when this idyllic pastime would spell doom for birds? The culprit is a new type of string imported from China, and also made in India, which endures abrasion, and strands that float freely from kites that have been cut, and are stuck in natural or artificial projections, ensnare birds that fly unwittingly into them; getting inextricably enmeshed while trying to struggle free. It's a tragic coincidence this, both being symbols of unfettered freedom, the free-flying bird, and the soaring artificial paper kite. Babu, Subramanya, and Dilawar record these fatalities in their paper, and provide some remedies.

Vyas and Upadhyay's paper on the breeding of Ashy Woodswallows carries pictures of the birds' eggs, nestlings, *etc*. These border on the risky side of the rules of the game, but the methodology used to take photographs was ethical, where the safety of the birds was paramount. It is a compelling visual scientific record of the woodswallow's breeding biology.

We welcome Prasad Ganpule on to *Indian BIRDS'* editorial board. We will benefit from his strengths.

—Aasheesh Pittie

Some notes on the breeding of Ashy Woodswallow *Artamus fuscus* in Gujarat, India

Raju Vyas & Kartik Upadhyay

Vyas, R., & Upadhyay, K., 2015. Some notes on the breeding of Ashy Woodswallow *Artamus fuscus* in Gujarat, India. *Indian BIRDS* 10 (1): 19–21.
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The Ashy Woodswallow *Artamus fuscus* is found across India, Nepal, Sri Lanka, Thailand, Myanmar, Laos, Malaysia, and China (BirdLife International 2013). It is widely found in most parts of India, including the drier zones of Gujarat and Rajasthan (Grimmett *et al.* 1998); its western-most record is from Jodhpur, Rajasthan (Sivaperuman *et al.* 2004). Publications regarding its breeding are scanty (Harington 1904; Santharam 1984; Ganesh & Kanniah 1985), and few relevant images on the Internet.

Here, we provide new information on the breeding of Ashy Woodswallow based on some observations in Gujarat, India. We observed the breeding activities of Ashy Woodswallow at three different locations in two districts of central Gujarat (Vadodara, and Dahod districts).

Gutal Village, Waghodia Tehsil, Vadodara District

On 24 March 2013, we discovered an Ashy Woodswallow's nest on a RCC electric pylon **[10]** standing in a landscape comprising open scrub, agricultural fields, and a water body, near Gutal Village, Waghodia Tehsil, in Vadodara District (22.373ºN, 73.434ºE). This nest was at a height of four meters, and located in an open slit on the pylon. A bird was on the nest, and three adultbirds perched on the electric wire about four to five meters from the nest. One of us (RV) climbed the pylon, and discovered the nest was ***c***. 08–10 cm in diameter; a shallow hemispherical cup, constructed with small dry twigs, grasses, and roots. Inside the nest was a black-coloured fledgling (? 2–3 days old), and two, very dull, speckled light brown eggs **[11]**.

Photos: Raju Vyas

10. Unusual nesting site of Ashy Woodswallow on an electricity transmission pylon. A bird is incubating, and two adult birds are nearby.

11. One chick with two eggs of Ashy Woodswallow.

We observed the nest from 24 March to 15 May 2013 through binoculars (8x40). We took pictures of the nest, and nestlings, at intervals of five to seven days to minimize disturbance.

On 28 March, we noticed just two eggs; the chick was missing. On 07 April there were two more eggs in the nest. The four eggs **[12]** were now continuously incubated by adult birds.

12. Four eggs in the nest of *Artamus fuscus*; a One Rupee coin is placed for size comparison.

On 22 April, we saw an adult bringing food to the nest, and assumed that the eggs had hatched. The next day we saw four chicks in the nest **[13]**. These may have hatched three to four days earlier, given their size and condition. All four had a few white fibre-like down feathers on their heads, backs, and both the wings. Based on the above, we estimate the incubation period to be of 23–27 days. On 01 May there was a chick missing from the

nest, while the other three were being fed by three different birds, almost in sequence. On 05 May there were only two chicks in the nest. We could not explain the sudden disappearance of the chicks within the span of a week. Had they been predated upon, or had they died naturally, and been removed by the adults? If a predator had taken them, then why were others spared? On 15 May, both the chicks left the nest early in the morning. They appeared similar tothe adults, exceptfor being duller, and smaller in size. Three adults were still attended to them **[14]**.

We observed that adult birds fed the chicks with various types of flying insects, including dragonflies, damselflies, and butterflies; we could not identify some insects. Feeding activities started at sunrise and ended with sunset; the feeding frequency being highest between 0900–1100 hrs and1600–1700 hrs. Over three days we noticed that the chicks were fed at an average of eight insects per hour, and their diet varied between 3–15 types of insects. They were fed 10–15 per hour during the peak feeding hours in the morning, 8–10 times during the evening. We also noticed that adult birds usually brought de-winged dragonflies as food to the nest **[15]**, rather than ones with intact wings **[16]**.

Photo: Raju Vyas

13. Four Ashy Woodswallow chicks in the nest.

Photos: Kartik Upadhayay

15. An adult Ashy Woodswallow on the nest with a de-winged dragonfly.

14. Three Ashy Woodswallow adults along with two chicks.

Photos: Kartik Upadhayay

16. A parent bird of *Artamus fuscus* with an intact dragonfly (most probably a female of *Rhyothemis sp.*).

Juna Rampura Village, Waghodia, Vadodara District

On 28 March 2013, we found a nest, under construction, on a similar electric pylon as the previous one, near Juna Rampura Village, Waghodia Tehsil, Vadodara District (2.37ºN, 73424ºE), situated 1.20 km from it. There were four adult birds in the vicinity of this nest. But after a few days this nest was deserted by the birds; no eggs had been laid. The birds might have abandoned the nest as a new cable was being stretched on that pylon.

On 05 May we observed a pair of Ashy Woodswallows, with two chicks, in the area. The parents were actively feeding dragonflies and damsel flies to both the chicks. These adult birds could have been the same that had abandoned the earlier nest reported above.

Dhanpar Tehsil, Dahod District

On 26 May 2013, KU observeda small group of Ashy Woodswallows in a protected area. There were two young birds, with four adults on a tall Silk Cotton tree *Bombax ceiba* at the high vantage point close to Bhuvero Village, Ratanmahal Wildlife Sanctuary, Dhanpar Tehsil, Dahod District. All four adults were helping feed the youngsters **[17]**.

The Ashy Woodswallow usually nests on trees (Harington 1904;Ganesh & Kanniah 1985), but recent studies have shown that the birds often adapt to the situation and nest on artificial structures too (Santharam 1984; Chun 2004; Narayanan 2013).

Our observations are in line with the known breeding behaviour of the species (Rowley & Russel 2009), i.e., presence of adult 'helpers' who assist the breeding pair in various nesting-related activities, like brooding, feeding, and protection; multiple broods in a season; usage of artificial nesting sites, *etc.*

Our observations coupled with earlier sighting records (Khacher 1996; Worah 1991 and Trivedi & Soni, 2006; Bhatt 2008) of the species from the state de note that not only *Artamus fuscus* is very widely distributed in various types of habitats from deciduous forest, thorny scrub to agricultural lands of Central and South Gujarat, but also the species breeds in these areas during March to May.

17. Three adults along with two young ones on a Silk Cotton tree.

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In Memoriam

K. S. LAVKUMAR KHACHAR

(1931–2015)

A record of Sooty Tern *Onychoprion fuscatus* from Gujarat, India

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The Sooty Tern *Onychoprion fuscatus* is a seabird of the tropical oceans that breeds on islands throughout the equatorial zone. Within limits of the Indian Subcontinent, its race *O. f. nubilosa* is known to breed in Lakshadweep on the Cherbaniani Reef, and the Pitti Islands, the Vengurla Rocks off the western coast of the Indian Peninsula, north-western Sri Lanka, and, reportedly, in the Maldives (Ali & Ripley 1981; Pande *et al.* 2007; Rasmussen & Anderton 2012). Storm blown vagrants have occurred far inland (Ali & Ripley 1981; Robin & Rao 2006; Taher *et al.* 2011).

No recent field guides for India show a record of the species in Gujarat (Kazmierczak 2000; Grimmett *et al.* 2011; Rasmussen & Anderton 2012). Ali (1954) did not come across the species during his survey of the birds of Gujarat. Consequently, Khacher (1996) did not mention the species in his account of the birds of Gujarat but admitted that our knowledge of terns, especially migratory and more marine ones, is comparatively meager, and that more information is needed. Parasharya *et al.* (2004) have listed the species based on a suspected sighting from Vadinar, Gulf of Kachchh (Tatu 1992). In this paper, we report the species within Gujarat state with photographic evidence; provide its morphometric measurements, and also present other unpublished records from the state.

Observations

On 18 May 2012, Mautik Dave, Director-World Wide Fund for Nature (WWF), Valsad Division, informed MUJ of a tern that had been rescued by Punit Patel at Khadki Village, near Pardi Town (20.517°N, 72.933°E), Valsad District, in Gujarat. Khadki is seven kilometers east of the coast. The tern was feeble and unable to fly, though it would spread its wings when disturbed **[18]**. The bird was photographed and its plumage described. It was weighed and sexed the next day, when it died. Its morphometric measurements (after Dhindsa & Sandhu 1984; Reynolds *et al.* 2008) were taken using ruled scale, divider, and digital vernier calipers to the nearest 0.1 mm. It was weighed on a 'Pesola' spring balance (300 g capacity, 1.0 g sensitivity) (Table 1). The specimen was dry preserved.

The tern was a female in adult plumage, and therefore was easily identified as a Sooty Tern. It had brownish-black upper parts and wings, whereas the under parts were white **[19]**. The white on its forehead did not extend beyond its eyes. A thin black line starting from the base of its mandibles reached till the base of a black crown. The leading edge of the wing was white. White outer-tail feathers were longest and gave a border-like appearance to the tail. The remaining tail feathers were black. The depth of the tail fork was *c.* 90 mm. The tail extended 10 mm beyond the wing tip. The remiges and rectrices were all new, and no moult was observed in the contour feathers. The beak and legs were black.

As evident from the data in Table 1, the tarsus and tail length values of the current record are the highest from amongst all published reports from India. The wing length was within the range recorded by Baker (1929), but slightly shorter than the value given for a female bird by Mathew & Shukkur (1974). The

Photos: xxxxxxxxxxxx

18. Adult Sooty *Tern Onychoprion fuscatus* on the ground. Note white forehead, prominent black line from bill to eye, white edge to the forewing, and white outer edge of the entire, prominently forked tail.

19. The Sooty Tern's head, back, and dorsal wing plumage was darker, tending towards black.

Table 1. A comparison of morphometric data of Sooty Tern *Onychoprion fuscatus* from Gujarat with some previous records

Body parts Sex	Jat & Parasharya 2015 Female (With regressed ovary)	Baker 1929 Male & Female	Mathew & Shukkur 1974 Female (With regressed ovary)	Ambedkar 1981 Male	Robin & Rao 2006 Female
Body weight (g)	98.5	–	–	–	–
Body length (mm)	385	–	–	–	355
Wing length (mm)	291	278–297	297	288	287
Beak length (mm)	46 (tip of maxilla to base of skull)	–	–	–	42.7
Bill–head	90.6	–	–	–	–
Culmen (mm)	41	35–42	39	42	–
Beak height (mm)	104	–	–	–	–
Beak width (mm)	84	–	–	–	–
Tarsus length (mm)	27	23–24	23	19	22.6
Tail length (mm) (Outer feathers)	172	145–162 (Outer feathers)	147	159	145

length of the culmen was within the range given by Baker (1929), but 2.0 mm longer than the value given for a female bird by Mathew & Shukkur (1974). Measurements of all the parameters of the current bird were larger than those reported by Robin & Rao (2006), for a female collected from the Valparai Plateau, in the Western Ghats. Other morphometric parameters reported, could not be compared, as they were not reported earlier from Indian samples.

Discussion

Sooty Tern was provisionally listed from Gujarat by Parasharya *et al.* (2004) based on earlier 'suspected' records, including Tatu (1992), and a sight record by M. K. Shivabhadrasinhji, Bakul Shukala, and Mrudula Shukla (Bakul Shukla, *pers. comm., verbally*) at Bhavnagar (Gulf of Khambhat), following a cyclone in 1976. Arpit Deomurari photographed a juvenile Sooty Tern on 06 May 2008 at Ajad Island (22.367°N, 69.383°E), off the coast of Poshitra, in the Gulf of Kachchh, Gujarat (Deomurari 2008). Subsequently, he recorded and photographed five immature birds, on 22 April 2012, at Charakala Saltpans (Arpit Deomurari, *pers. comm., verbally*). Hence, this specimen substantiates earlier sight and photographic records of its occurrence within Gujarat. Past and present records from Gujarat indicate the possibility of its occurrence along the entire coastline. However, we need to watch out for wind-blown birds after cyclonic / stormy weather.

Though the species is known to occur in Indian Territory, there are no specimens available in the collection of the Bombay Natural History Society, Mumbai (Abdulali 1970a, b). In recent past, morphometric measurements of only four parameters, from three specimens, were recorded (Mathew & Shukkur 1974; Ambedkar 1981; Robin & Rao 2006). We felt that reporting detailed morphometric measurements of a bird was ornithologically important.

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20. A view of Chatri Talav where the Eurasian Bittern was sighted

Sighting of the Eurasian Bittern *Botaurus stellaris* at Amravati, Maharashtra, India

Rahul Gupta

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On 04 January 2014, while observing and photographing birds at Chatri Talav (21.099°N, 77.948°E), a lake located on the outskirts of Amravati town, Maharashtra **[20]**, I heard a loud call, which was traced to a bird slightly larger than an Indian Pond Heron *Ardeola grayii*, flying low over water about seven meters away. Three quick photographs were taken of the bird, as it landed within a stand of Ipomoea (*Ipomoea* species) growing on the periphery of the lake, and disappeared in it **[21]**. Based on the photographs, it was later identified as an Eurasian Bittern *Botaurus stellaris* **[22]**.

The Eurasian Bitten is known to be a winter visitor to India, in small numbers, and has been recorded across northern India. Further, it is known to straggle through the rest of India, affecting wetlands with dense reed-beds and bulrushes (Ali & Ripley 2001; Rasmussen & Anderton 2012). Its status is considered as *scarce to rare* (Rasmussen & Anderton 2012). Prasad (2006) contains records from western Maharashtra, and cites 'LP's' [=Leon Pereira] record of one bird from 'Melghat, Amravati district', on 29 October 2001. It was also sighted at Wadali Lake in February during 2006–2008 (Pachlore & Chandrakar 2011). The present sighting happens to be the third one for Amravati, and hence, is considered significant for the region.

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Photos: Rahul Gupta

21. A view of the Ipomoea clumps where the Eurasian Bittern disappeared

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22. Eurasian Bittern sighted in Amravati

A Great Spotted Woodpecker *Dendrocopos major* in Nagaland

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In April–May 2014, our team spent about a week in Nagaland on a birding-cum-photography expedition. The intention was to explore and identify good habitats for lesser known birds, whose distribution is restricted to the hills south of the Brahmaputra River. On 01 May 2014, around 0830 hrs, we came across a female Great Spotted Woodpecker *Dendrocopos major*, at a location that was about 30 kms from the village of Pungro (25.8°N, 94.833°E), Eastern Nagaland. This sighting was immediately after we saw a cacophonous mixed hunting flock comprising Yellow-throated Laughinthrushes *Dryonastes galbanus*, Spot-breasted Scimitar Babblers *Promatorhinus erythrocnemis*, and Spot-breasted Parrotbills *Paradoxornis guttaticollis*.

Photo: J. Kuriakose

23. Great Spotted Woodpecker *Dendrocopos major.*

The habitat was recorded as dry hill slopes with pine trees *Pinus sp.* and tall grass. The woodpecker uttered a short, hard and loud, '*CHyek*' call, while it flew into one of the pine trees, on which it scaled up a few meters, feeding, before it flew about 20 m across the road to another pine tree. This species is differentiated from the similar Himalayan Woodpecker *D. himalayensis* by its white shoulder patch and by the distinct separation of cheek and neck patches **[23]**. Its underparts are darker, and dirty buffish-brown with a black bar extending down the sides of its breast. A dark border to ear-coverts joins the nape. The bold red patch that is present in a male, was lacking, and hence the bird was thought to be a female.

Though not unexpected, this appears to be the first photographic record of this species from Nagaland. Ali & Ripley (1987) include Nagaland in its distribution range. Choudhury (2001, 2003) also lists it from the state, but does not mention a specific record. Earlier records of this species from India are from Manipur (Rasmussen & Anderton 2012), where Walter N. Koelz collected ten specimens (UMMZ 144649–58) from Karong, Manipur, between 28 September 1950 and 07 December 1950 (http://portal.vertnet.org/search?q=%22Dendrocopos+major%22+country:%22India %22). It was recently sighted further north, in Namdapha National Park, Arunachal Pradesh (Srinivasan *et al.* 2010). The bird is believed to have a stable population in Europe, South-east Asia, including northern Myanmar (BirdLife International 2012). This sighting is not only the first photographic record of the species, but it also another jigsaw piece that fits into its distribution range.

Acknowledgments

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In Memoriam

PRAKASH GOLE
(1938–2013)

Sighting of Short-tailed Shearwater *Ardenna tenuirostris*, and Wedge-tailed Shearwater *Ardenna pacifica* from the Arabian Sea, off Ponnani, Kerala

Praveen E. S., Sandeep Das, & Dilip K. G.

Praveen E. S., Das, S., & Dilip K. G., 2015. Sighting of Short-tailed Shearwater *Ardenna tenuirostris*, and Wedge-tailed Shearwater *Ardenna pacifica* from the Arabian Sea, off Ponnani, Kerala. *Indian BIRDS* 10 (1): 26–27.
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The Short-tailed Shearwater *Ardenna tenuirostris* (Family Procellariidae) is one of the world's most abundant shearwaters, with, approximately, 23 million birds breed on Tasmania, and off the coasts of southern Australia from September to April (BirdLife International 2014). It is a trans-equatorial migrant, wintering north of Japan, near the Aleutian Islands (USA), with some birds moving north of the Bering Strait. Recent studies suggest that a majority of the birds fly north, along the western part of the Pacific Ocean, to the Arctic region, returning southwards over the centre of the ocean. They travel *c*. 15,000 km in each direction, annually, and they have been known to cover this enormous distance in six weeks!

The Short-tailed Shearwater **[24]** is uniformly dark brown, with a rounded head, and a short tail. Dark feet project noticeably beyond its tail; a short bill, and darker wing lining is typical of the species. There exists only a single record of this species from India, from West Bengal, in April 2013 (Giri *et al*. 2013), and one from Bangladesh (Thompson *et al.* 2013).

Photo: Sandeep Das

24. Short-tailed Shearwater photographed on 27 April 2014.

This note describes the sighting of a Short-tailed Shearwater, from the Arabian Sea, off the coast of Ponnani, Malappuram District, in Kerala, on 27 April 2014 (10.766°N, 75.798°E). The bird was sighted during a pelagic trip organized by the Kerala Forest Department, under the *Green Partner's Program*, wherein regular birding trips are organized throughout the year. With 15 birders onboard, we travelled *c.* 12 km westward, into the Arabian Sea. The sea was calm, and the weather, sunny, with little breeze. There were multiple sightings of Flesh-footed Shearwater *A. carneipes* in groups of 15–30 individuals.

While birding, we saw a smallish shearwater flying past our boat **[25]**, and returning to settle on the surface of the water. We approached to about 20 m of the bird, which was briskly pecking in the water, while floating, and occasionally, diving completely underwater. The bird resurfaced after *c.* 15–20 sec., with nothing visible in its beak. This was a rather an uncommon sight, for none of the numerous Flesh-footed Shearwaters present, ever showed such behavior. We observed the bird for about five minutes, and clicked photographs.

Photo: Praveen ES

25. Short-tailed Shearwater flying past our boat.

The bird's head was rounder than, and it looked, overall, much smaller than the Flesh-footed Shearwaters that were close by, thus enabling easy comparison. Later, when we tried to approach closer, it flew off, circling the boat, flying like a typical shearwater **[26]**, with feet projecting beyond its tail. It was clearly a smaller shearwater, confining our identification options to either the Sooty-, or the Short-tailed Shearwater. The former is considered to be hypothetical in the region (BirdLife International. 2014). Several photos that were clicked, analysed, and 'typical' ones transmitted to Praveen J., and Dipu K., for verifying our identification; which they confirmed. Further to this, David James (VENT tours Sydney); International expert on seabirds identification, and staff editor for *Handbook of Australian, New Zealand and Antarctic Birds*), commented

> *"Yes, short-tailed Shearwater, Pale under wing consistent with a Short-tailed or Sooty type. Note the short bill, trailing toes, dark cap, pale throat, solid dark triangle at base of under wing, dark smudging through pale area of under wing coverts, all typical of short-tailed and not sooty. A classic looking bird (or birds)."*

Photos: Praveen ES

26. Short-tailed Shearwater in flight.

27. Wedge-tailed Shearwater.

Though it is considered to be a vagrant in India, there are reports of regular sightings of these birds off the western coasts of the Malayan peninsula (Giri *et al.* 2013). This sighting from the Arabian Sea, first off the Kerala coast, together with the ones mentioned earlier, suggests that some birds drift off from their normal course of migration, in the western Pacific, to cross the Indian Ocean during their spring migration.

On our return journey we photographed a Wedge-tailed Shearwater *A. pacifica* **[27]**, which had been earlier recorded from the seas off Kannur, in Kerala, in May 2011 (Praveen *et al.* 2013). This is the second photographic record of this species from India.

Acknowledgements

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Buffy Fish Owl *Ketupa ketupu* breeding in Sundarbans Tiger Reserve, India

Manoj Sharma, Soma Jha & Atul Jain

Sharma, M., Jha, S., & Jain, A., 2015. Buffy Fish Owl *Ketupa ketupu* breeding in Sundarbans Tiger Reserve, West Bengal, India. *Indian BIRDS* 10 (1): 27–28.
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On 13 July 2014, at 1030 hrs, Soma Jha [SJ] came across a fish owl (Strigidae) on a nest of twigs in a bare tree, on the edge of Choragazi Channel, close to 'Do Banki' camp in Sundarbans Tiger Reserve, West Bengal, India. As the noisy diesel-engine boat approached the bank, the owl got disturbed and took off, but returned to resume its perch as the boat drifted away. The owl was observed for 30 min from a distance of 10–50 m. On 31 July, at 1306 hrs, we revisited the nesting location and made observations for 20 min. An individual owl was in the nest, which was, apparently, an old, raptor's construction, in a dry tree, *c.* 08–10 m above the water **[28]**. The nesting tree was on the edge of a mangrove forest overlooking a 70–80 m wide water channel. We estimated that the nest was at least 38–50 cm deep, as only the head of the owl was visible above its rim. When the boat approached the bank, the owl flew out of the nest and perched on an open tree trunk some 10 m inside the mangrove forest, offering us a clear view of it. As earlier, as soon as the boat drifted away, the owl returned to the nest. It was first seen there on 26 June 2014 (*pers. comm*., Nityananda Chowkidar). The dry tree, on which the owl was nesting, was identified as a 'Keora' tree *Sonneratia apetala* (*pers. comm*., Krishnapada Baidya). The returning behaviour to the nest, suggests that the owl was probably incubating. One chick was observed at the nest site, along with an adult, on 26–27 August 2014 (*pers. comm*., Jainy Kuriakose), and from 31 August to 02 September (*pers. comm*., Harkirat Sangha).

28. Buffy Fish Owl *Ketupa ketupu* in nest.

The bird in question was a typical fish owl, superficially resembling a Tawny Fish Owl *Ketupa flavipes*, though smaller in size. The other features we noticed were, a streaked forehead, a prominent white crescent above the bill, white eyebrows, a prominent yellow iris, and a black beak. It had an ill-defined, un-streaked, warm brown facial disk, sideward-directed ear tufts, a diffused white throat patch, and yellowish brown underparts with black streaks that became weaker towards the belly and lower flanks. It had a black mantle, and its dark brown wings were edged tawny, and barred buff-yellow. The flight feathers, and tail sported buff-white barring **[29]**. It had longish, un-feathered tarsi, and very round wings in flight. Based on these observations, the bird was identified as a Buffy Fish Owl *Ketupa ketupu*.

The Buffy Fish Owl is the smallest of the fish owls (Marks *et al.* 1999), and is categorised under 'least concern' by BirdLife International (2014). It is much smaller than the similar Tawny Fish Owl (Rasmussen & Anderton 2012). The first published record of this species from the Indian Subcontinent was by Coltart (1904), when a specimen was obtained from 'Upper Assam'. Stevens (1915) records it, 'in all probability generally distributed in plains of upper Assam'. Baker (1927) 'found it not very rare in the hills of south Assam'. However, Ripley (1982) did not include it in his work *Synopsis*, as there are no specimens from the Indian Subcontinent in the British Museum (Abdulali 1972); neither does the collection of Bombay Natural History Society (Abdulali 1972). König *et al.* (1999) do not show its distribution within the Indian Subcontinent. However, Marks *et al.* (1999), and Dickinson & Remsen (2013) include southern Assam, and NE India, respectively, in its distribution range. It has been recorded from the Sundarban area of Bangladesh (Neumann-Denzau & Denzau 2003; Khan 2005; Khan 2009). Khan (2009) record it's breeding from the Sundarbans area of Bangladesh. There have been recent photographic records of the species from the Sundarbans Tiger Reserve. The species was photographed in January 2010 (*pers. comm*., Nikhil Bhopale). A bird was photographed on 18 March 2012, close to the Sajnekhali watch-tower (Das 2012).

BirdLife International (2014) considers it possibly extinct in India, as there are no records of it since Coltart (1904), Stevens (1915), and Baker (1927). Only Baker (1927) records it's breeding from the southern Assam Hills, and Dibrugarh. The present record is the first photographic documentation of a breeding Buffy Fish Owl from India.

Photos: Manoj Sharma

29. Buffy Fish Owl *Ketupa ketupu*.

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Snapshot sightings

Red Knot at Chavakkad, Kerala

P. P. Sreenivasan


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A single Red Knot *Calidris canutus* was photographed on 15 September 2014 at Puthankadapuram beach (10.57°N, 76.02°E), Chavakkad, Kerala, India, during Onam Brid Count, amongst other waders that included a Curlew Sandpiper *C. ferruginea*. The bird was moulting into winter plumage, showing reddish-tinged under parts. Shorter beak, with wing tips reaching tail tip, separate it from the larger Great Knot *C. tenuirostris*. Though the species is reported as regular on the eastern coast of India (Balachandran 1998), this is the first report from Kerala (Sashikumar *et al.* 2010; Praveen & Narayanan 2014).

B-27, Guruvayur Dewasom Quarters, Puthanpally (PO), Tamarayur, Thrissur, Kerala, India. Email: sreenivasangvr@gmail.com

A leucistic Black-tailed Godwit from Mangalajodi, Odisha

Panchami Manoo Ukil


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On 18 November 2014, a leucistic Black-tailed Godwit *Limosa limosa* was photographed amongst a flock of 15 godwits that formed a part of a larger 1000+ congregation at Mangalajodi (19.92°N, 85.43°E), Chilika Lake, Odisha, India. The bird stayed there for several days and was reported by other photographers. There are no earlier reports of godwits in this plumage from India, though such birds have been photographed from Thailand (Sikkens & Sikkens 2009), and China (Townshend 2011).

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Little Gull at Okhla, Uttar Pradesh

James Lambert

A first winter Little Gull *Hydrocoloeus minutus* was photographed amongst a large flock of *c.* 300 Black-headed Gulls *Chroicocephalus ridibundus* on 17 December 2014 at Okhla Bird Sacntuary (28.55°N, 77.31°E), Noida, Uttar Pradesh, India. The Little Gull is a vagrant to India, with very few verifiable reports from northern India (Praveen *et al.* 2014). Though photographs are not sharp,


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the comparative size, in relation with the Black-headed Gulls, black traverse band on upper wings, more round wings, black terminal band and white on secondaries separate this from other gulls, including first winter Black-legged Kittiwake *Rissa tridactyla*.

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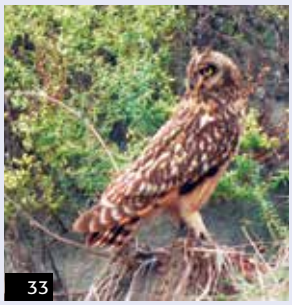
Short-eared Owl from Tuticorin, Tamil Nadu

Murali Rajagopalan [MR] & Muthunarayanan K. [MK]


33

While birding on 28 December 2014 near Tuticorin Port Area (8.77°N, 78.18°E), Tamil Nadu, India, MR photographed an owl that was later identified as a Short-eared Owl *Asio flammeus*, based on its yellow iris, shorter ear tufts, and whites on the edges of primaries. On 31 December, both of us observed three individuals in the same location and more observers reported it since then. Though this species is supposedly widely distributed in southern India, including Tamil Nadu (Grimmett *et al.* 2011; Rasmussen & Anderton 2012), actual reports are few, and historically, it has been reported from the Nilgiris and Chennai (Whistler & Kinnear 1935); recent reports are entirely from the latter area (Anonymous 2014). This is its first report from southern Tamil Nadu.

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